A COMPARISON OF OCEANIC PARAMETERS DURING UPWELLING OFF THE CENTRAL COAST OF CALIFORNIA

by

Arthur Bishop Shepard

United States
Naval Postgraduate School

THESIS

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Arthur Bishop Shepard
Lieutenant, United States Coast Guard
B.S., United States Coast Guard Academy, 1963

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ABSTRACT

An examination of the region between Monterey Bay and San Francisco Bay, California was conducted from 29 April to 5 May 1970 to study the effects of upwelling on the Central California, coastal region. Six parameters: temperature, phosphate, beam transmission for light, chlorophyll a, Coulter particle size distributions, and oxygen were observed at eighty-five stations from the surface to 100 m in the cruise area. The data gathered are presented in the form of horizontal contours and profiles which indicate: (1) Almost the entire surface layer was saturated with respect to oxygen. (2) there were four areas, at the northern and southern ends of Monterey Bay, off Point Montara, and west of the entrance to San Francisco Bay, which exhibited high values of chlorophyll a, oxygen, and particle count, for correspondingly low phosphate values and low beam transmission. (3) These productive areas are inshore, generally within 5-10 miles of the coast. (4) A peak in the size distribution of particles was evident in the productive surface layers, within the observable range of particle diameters (1.59 to 32.0 μ). (5) Plots of oxygen versus phosphate showed that similar slopes of about $-3.1 \frac{\mu g\text{-at/l } PO_4}{ml/l\ O_2}$ were observed for inshore and offshore regions. The inshore regions exhibited higher phosphate values for a given value of oxygen which is probably a result of upwelling. (6) There was a fair correlation between beam transmittance and particle count. High values of beam transmittance were generally associated with low total Coulter count, e.g., 90%/m and 6000 counts per 2 ml. Conversely, low values of beam transmittance were associated with high particle counts, for example 5%/m and 85,000 counts per 2 ml.

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I. INTRODUCTION

A. ENVIRONMENTAL FACTORS

Our knowledge of the ocean depends on sampling and collecting data over a period of time and is based on composite pictures of regions of interest. The upwelling areas of the world are of particular interest because of the high productivity associated with them, and because existing or proposed waste disposal sites are located in some of these regions. An estimated one-half of the world's supply of fish comes from upwelling regions, even though the total surface area involved is but one-half of one percent of the total surface area of the oceans. This can be explained in terms of the food chain, that is, the number of steps from photosynthetic phytoplankton, through grazers, to the ultimate consumer. Due to both the colonial habits and the large size of phytoplankton in upwelling areas, food chains in such regions tend to be shorter than where there is no upwelling [19].

Production of a standing crop of phytoplankton in upwelling areas is limited to the surface layers, where there is a favorable total concentration of nutrients, which for phosphate, for example, can be as low as 1.0 μg-at/l and still permit vigorous growth. Since photosynthesis is limited to the euphotic zone, that region for which the intensity of light is greater than approximately one percent of that incident on the surface, productivity is light-limited as well as nutrient-limited. The availability of light in the euphotic zone depends on three principal factors: productivity, land runoff (which contributes particulates and disolved organic matter), and, in regions adjacent to densely populated metropolitan centers, waste discharge. Of the three factors, both runoff

and productivity are natural features of a region normally not subject to control. Waste discharge however can be controlled.

The problem of waste disposal by dilution in the ocean, a practice commonly followed in coastal regions, is becoming more and more acute. With increasing population growth, present disposal methods are proving to be inadequate to handle the increasing quantities of waste which are being generated. Generally the ocean has been considered a great sump into which wastes can be pumped with no danger.

Experience has shown that dilution of wastes pumped into the sea is in fact much less than expected. Attempts have been made to design outfalls and diffuser systems to minimize the adverse effects of such disposal. It nevertheless remains to be seen what will be the short and long term effects of the enormous volume of wastes (1.4 billion gallons per day) expected by the year 2000 on the coastal waters of central California. As Smith [21] points out: "If waste is to be pumped into the sea off coasts where upwelling is prevalent, it is apparent that adequate scientific knowledge of the upwelling process is needed".

Of the world's fish supply not associated with upwelling areas, i.e. approximately one half of the total supply, almost the entire quantity is to be found in the shallow regions of the continental shelves where waste disposal is a more apparent problem. Nutrients in these regions are supplied to the euphotic zone by runoff from the land and by other hydrographic features like turbulence and convection. Turbulence tends to homogenize the water mass and thus distribute dissolved nutrients to considerable depths.

For maximum phytoplankton production turbulence must be followed by a stratification or stabilization of the water mass to allow phytoplankton to remain in the euphotic zone [22, p. 941]. Thus turbulence as well as

upwelling raise the level of nutrients at the surface; indeed, one-half of the phosphate enrichment of surface waters off Peru, for example, appears to be due to turbulence and the other half to upwelling [21].

Thorade in 1909 postulated that the anomalously cold water along the California coast was due to upwelling. He showed that vertical advection of deep water was needed to replace surface water transported offshore by the northerly winds paralleling the coast, which, because of the Coriolis effect, causes a net transport in a direction 90° to the right of the wind. This was the first application of Ekman's Theory [21].

Skogsberg [20] was the first to treat the oceanographic climate of the Monterey Bay region as being divided into three distinct seasonal phases, namely the cold and warm water phases and the low thermal gradient phase. These three features were later referred to and described by Bolin [4] as the Upwelling Period, the Oceanic Period, and the Davidson Current Period.

The Upwelling Period is initiated by the change in the surface winds of January and February to a generally northerly flow paralleling the coast. Water is transported away from the coast and replaced by deeper water advected vertically upward from depths probably not exceeding 200 meters according to Sverdrup [22]. This period is characterized by: the lowest surface temperatures in the annual cycle; salinity values which rise to the high point of the year and are followed by a subsequent decline; and a strong vertical temperature gradient of more than $1^{\circ}C$ per 16 m.

The steady northerly winds of spring become intermittant in late summer and provide interruptions in the coastal upwelling, which allow the cold dense water to sink, causing convergences. Warm inshore surface water flowing offshore and an inflow of oceanic surface water to replace

the sinking, denser water establish a sharp thermocline in the first few meters. The Oceanic Period is characterized by surface temperatures as much as 2-3^{o}C higher than the peak temperatures during the upwelling season, by a continuation of the strong vertical gradient established during the period of upwelling, and also by calm conditions which constitute a transformation between the northerly winds of the Upwelling Period and the southerly winds of the Davidson Current period. The influx of oceanic surface water, the rise in the surface water temperatures, and the decrease in nutrient levels due to a lack of upwelling, lead to a decrease in the productivity of the local phytoplankton. With the influx of oceanic surface water a number of offshore phytoplanktonic species are brought into the Monterey Bay region, an environment more fertile than the open ocean but less fertile than during the height of upwelling. The inoculum finds conditions for growth more favorable than normal and multiplies, increasing the diversity of forms in the coastal water. Therefore, a progressive reduction in the productivity for the area is checked. Thus, although initial local populations may require highly fertile waters, subsequent oceanic inputs are able to subsist at lower nutrient levels, and an average supply of plants is maintained for the grazers in the area. In their study of the marine climate of central coastal California Bolin and Abbott noted that if upwelling is intermittant, plankton volumes are high, and if upwelling is steady, plankton volumes are lower [3].

After the calm of the Oceanic Period the winds become southerly in November. The Coriolis effect causes a shoreward transport of water and an accumulation of low density water along the coast. This has two primary effects on the California coastal environment. A current is formed as a result of the piling up of light waters, which parallels and reinforces

the wind driven current; sinking of the surface waters occurs, and relatively isothermal conditions are established to a considerable depth. The Davidson Current period lasts until February and provides the only sharp climatic change in the cycle. Its onset is characterized by an abrupt decline in surface temperature.

B. BACKGROUND

In general the distribution of oceanic parameters in the study region is complicated by vertical advection, entrainment, biologic activity, and, near the entrance to the San Francisco tidal prism, brackish discharge during the upwelling period. Of particular interest is the altering of the individual physical and chemical properties, especially in the first 100 meters, during this period.

1. Phosphate

Phosphate increases with depth to a maximum that corresponds to the oxygen minimum. The lowest values generally are found at the surface, where the usual concentration at mid-latitudes is of the order of 0.2 μg-at/l [21]. In the California coastal region phosphate concentration changes in an abrupt manner in the late winter and spring. The suddenness of the change can be attributed to upwelling of nutrient enriched water into the surface layers, which replenishes the water depleted in phosphates throughout the fall and early winter. The abundance of nutrients in the euphotic zone is a stimulus for growth of phytoplankton, and patchy areas of productivity become evident, further complicating the analysis of observations. Measurements of phosphorous in the form of phosphate conducted off the central California coast by the California Cooperative Fisheries Investigations (CALCOFI) in July 1950 indicate values of 2 - 2.5 μg-at/l to be present at 100 m [5].

2. Dissolved Oxygen

Oxygen is generally at or above saturation at the surface, due to aeration and photosynthesis, but decreases in concentration with depth to a minimum at some intermediate depth. The saturation value of oxygen depends upon both salinity and temperature. The latter is the dominant factor off the central California coast. Since oxygen is replaced in the surface layers and is consumed throughout a water column by respiration and decay, the subsurface waters tend to be low in dissolved oxygen. When upwelling occurs, such oxygen-low waters are brought to the surface and are typically undersaturated. Park, Pattullo, and Wyatt observed values of dissolved oxygen concentration to be 60 - 70% of saturation during upwelling off the Oregon coast [15].

During upwelling, a fair correlation may be observed, though generally not at the surface, between oxygen and temperature. Pytkowicz [16] showed correlations between oxygen and inorganic phosphate for Oregon coastal waters and suggested that a subsurface oxygen maximum is formed as a result of the summer upwelling, when the rate of escape of oxygen exceeds its rate of production by photosynthesis.

A subsurface oxygen maximum was observed by Stefansson and Richards in the same coastal region and was attributed, not to photosynthesis, but to a sinking along isentropic surfaces of water which had been enriched previously by photosynthesis nearer shore. They also noted a good statistical correlation between dissolved oxygen and density, except in the upper layers.

3. Chlorophyll a

Chlorophyll a is perhaps the most important of the plant pigments, and observations of the concentrations of chlorophyll a can give indications of the production of phytoplankton. In the first ten meters

chlorophyll a undergoes greater diurnal changes than any other plant pigment, which indicates that it is more quickly synthesized and decomposed. Concentrations which were up to five times greater at midnight than at noon were observed, for example, in East Sound, Washington,a stratified inlet with little exchange [25]. Ramsey [17] on the basis of tests of the remote sensing of ocean color indicated that definite changes in the spectrum of the upward flux from the sea occur with varying chlorophyll content. An aircraft has been used as a platform for the TRW spectrometer[1] in the analysis of the backscattered light from the sun and sky and the highest percentage of the backscattered light was observed in the green portion of the spectrum [6]. This spectral peak was compared to concentrations of chlorophyll measured with a continuous reading Turner fluormeter.

Yentsch and Scagel [25] agree with Sverdrup, Johnson, and Flemming [23, 25]: For primary productivity to take place a certain degree of stability must be reached in a water column, since pigment synthesis or decomposition depends on the duration of exposure to, as well as on, the intensity of light.

4. Beam Transmittance

The primary task of optical oceanography is to find out which ingredients in sea water are optically active and to study scattering together with absorption in order to understand the propagation of light in an oceanic medium [9, p. 1]. Scattering in the sea is primarily what may be described as Mie scattering, that is scattering due to particles and living organisms having sizes of the same order of magnitude as the

[1]The TRW spectrometer is an electro-optical sensor of the off-plane Ebert type with a spectral range of 400 to 700 nm and a spectral resolution of 5 to 7.5 nm.

wave length of light [7]. For large suspended particles the intensity of light scattering according to the Mie theory is predominantly in the forward direction. Scattering of light by highly filtered sea water, however, may be considered as being similar to scattering by pure water, a problem of molecular or Rayleigh scattering, since there is no noticeable effect from the various solutes [7, p. 22, 53]. Rayleigh scattering is a maximum in the forward and backward direction and a minimum in the plane at right angles to the incident light. Absorption, on the other hand, can be attributed to suspended particulate matter as well as to solutes.

A beam transmissometer is used to measure the total beam attenuation coefficient, c, which may be represented as the sum, c = a + b, where a is defined as the total absorption coefficient, and b is defined as the total scattering coefficient.[1] In a beam transmissometer a light source which emits a collimated beam of light is housed at one end of the instrument, and a detector is housed at the other end of a fixed path-length to receive the parallel rays.

The beam transmissometer may be used in situ with a depth sensing device to record transmittance as a function of depth (Figure 1). Beam transmissometers may be used with scattering meters to study two constituents of sea water, namely particles and "yellow substance". The oceanographic interest in the distribution of these components is

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[1] The total beam attenuation coefficient c (= a + b) is given by $c = -(1/I)dI/dx$, where I is the radiant flux incident on a thin layer of thickness dx normal to the beam and dI is the radiant flux lost to the beam due to the effects of scattering and absorption. If this equation is integrated, $I(x) = I(0)e^{-cx}$, where I(x) is the radiant flux of the beam at a distance x in the direction of propagation from a point where the flux has the value I(0). Normally x is taken to be 1 m, so that $I(1) = I(0)e^{-c}$. The transmittance per meter, T, is then defined as the ratio $T = I(1)/I(0) = e^{-c}$. Sometimes the term "beam attenuation", A, is used. It is related to the transmittance: T + A = 1.

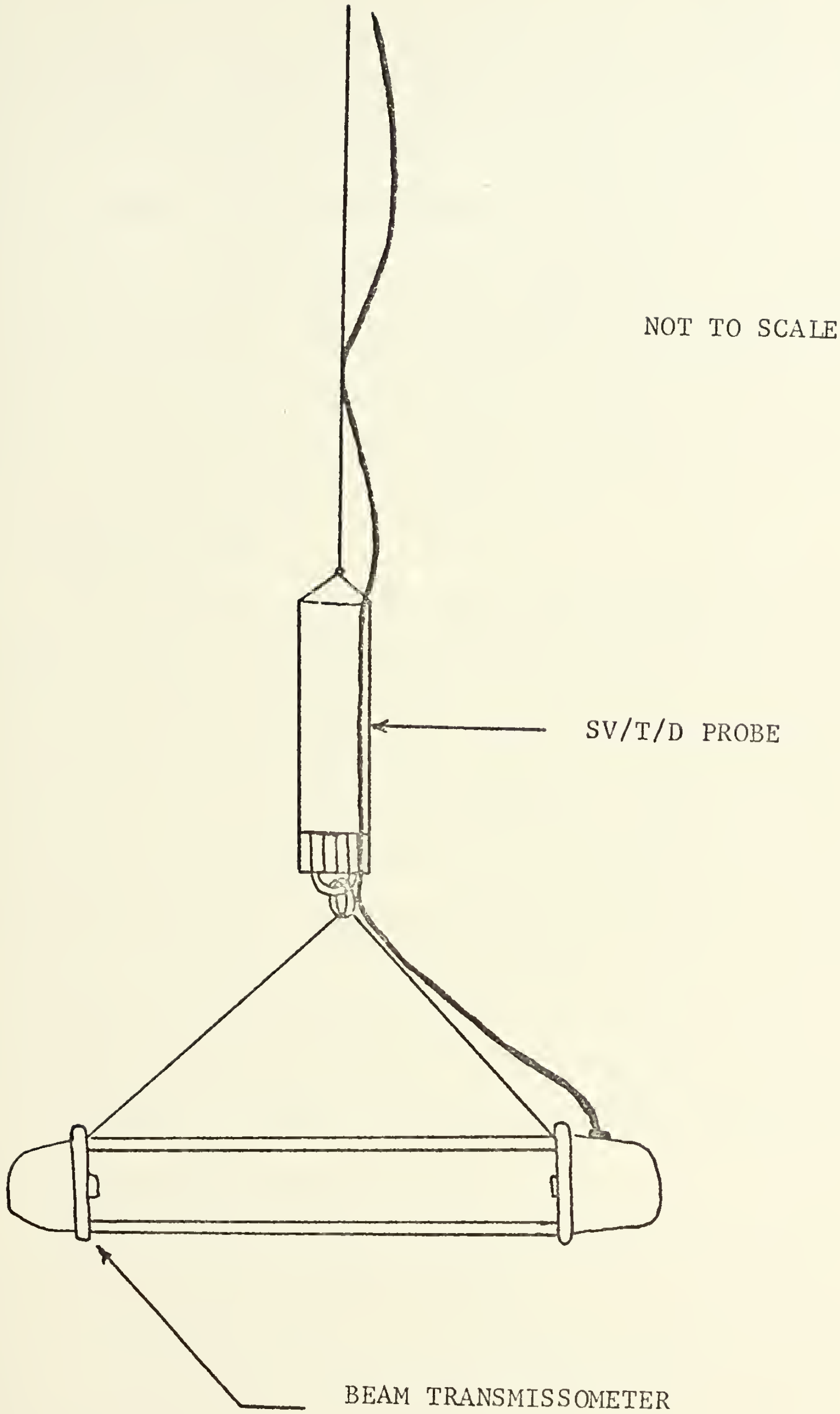

Figure 1

dictated by the desire to find suitable parameters to characterize water masses [9, p. 155]. "Yellow substance" is a collective name for dissolved organic substances probably formed from carbohydrates and amino acids. The yellowish end product is fairly stable in sea water and is found in coastal areas and regions of upwelling. An inverse proportionality seems to exist between the decomposition of chloroplastic pigments and the production of the yellow absorbing substances. This relationship indicates that yellow substance may be a derivative of protein carriers coupled to the chlorophyll chromophores [24].

5. Particulates

The optical properties of a water mass to the extent they differ from those for pure water are largely due to dissolved matter and suspended particulates [9, p. 1]. A determination of particulate concentrations may be accomplished by weighing. Size distribution and total counts may be determined either with a microscope or electronically, for example with a Coulter counter, which measures the diameter or the volume of particles suspended in an electrolyte. The Coulter counter provides a rapid means of analyzing a particulate sample, and satisfactory results can be obtained as long as the particles to be counted are not less than about 1.5% of the aperture size [8].

Measurements by Yeske and Waer [26] indicated that approximately 96% of the suspended particles in Monterey Bay were less than 8.5 μ. Labyak [11] found that approximately 90% of the particles affecting beam transmittance in the coastal region between Monterey and San Francisco Bays were less than 12 μ in diameter. Baker [1], who examined the same region as Labyak, concluded that 74% of all particles examined had a diameter less than 6.2 μ. However, the total counts observed in these studies were extremely low when compared with the results obtained for

the May 1970 cruise. Therefore, for purposes of comparison, examples of counts for turbid, intermediate, and clear waters were sought. The following are examples of particle counts per milliliter of sample for a threshold[1] size of 1.0 μ: Bahama Banks—50-70 x 10^3; Sargasso Sea surface water—12-20 x 10^3; Sargasso Sea deep water (below the mixed layer)—3-8 x 10^3 [8].

Suspended particles, either organic or inorganic, affect light attenuation; for example, heavy concentrations of particulate matter diminish the vertical extent of the euphotic zone. During upwelling high particle counts and low transmissivity are to be expected. Joseph [10] has pointed out the need for more measurements of beam attenuation in upwelling waters. A good relationship between suspended matter and chlorinity has been noted by Manheim [12], who found a gradual and linear decrease in the concentration of suspended matter with increasing chlorinity. This suggests that initial concentrations are being diluted with sea water as they progress seaward. A general trend has been observed toward decreasing numbers of particulates with increasing depth and distance from the coast, which can be altered by tidal and wind driven currents, local winds, land runoff, mixing, and upwelling.

Changing particulate concentrations can leave areas of patchiness in the sea and can make observations based on single observations at fixed points misleading. Turbulence can alter near-bottom particulate distributions.

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[1] When referring to particulate counts with the Coulter counter, the word "threshold" is used to refer to a size range into which particulates can be separated electronically after the instrument is calibrated with particles of a known size. Hereafter, "threshold setting" will refer to that channel number or equivalent spherical diameter from which reliable counts (free of background noise) can be obtained; e.g. channel 13 which corresponds to an equivalent spherical diameter of 1.59 μ.

Thus, clouds of particles are frequently encountered at levels 10 to 50 m above the bottom [9].

6. Temperature

In order to appreciate more fully the impact of upwelling on the climate of the central California coastal region it is necessary to note that the yearly average offshore surface temperature of the Pacific Ocean for the latitude of Monterey Bay is 21°C, while the average annual surface temperature for the Bay is approximately 13°C. The annual range of surface water temperatures is less for regions where summer upwelling occurs. Thus, along the western coast of the United States the annual range of surface water temperatures is less than 3°C, while west of the California current the range exceeds 7°C [21].

The suppression of surface water temperatures due to upwelling contributes to differential heating and increases the atmospheric pressure gradient and associated winds. It can be seen, therefore, that through depression of sea surface temperatures upwelling strengthens the diurnal sea breeze and brings cool, moist air inland [21].

Examination of vertical temperature sections from offshore to the coast shows marked horizontal and vertical gradients and sharply ascending isotherms. According to Stefansson and Richards [22] in a study of the Washington and Oregon coastal region during upwelling, the temperature structure is formed as cold, originally deep, water mixes upward in a stepwise fashion, the ascending water mixing with the overlying warmer water.

There is an indication that upwelling follows certain routes in Monterey Bay, along the axis of the Monterey Submarine Canyon, and that strong upwelling along the upper reaches of the canyon lowers the surface temperatures over and adjacent to this feature during the spring and summer [3].

Upwelling can be expected in areas where there is a divergence of surface flow. On the western coasts of continents, for example, during certain periods when the winds parallel the coast and blow equatorward, a characteristic single-sided divergence occurs, which transports light surface waters offshore. To maintain continuity, dense, cold, oxygen-poor, and nutrient-enriched waters are advected vertically from intermediate depths. The anomalies produced by the upwelled waters impinging on the surface layers are evident as strong horizontal gradients of physical and chemical properties, which normally only have marked vertical gradients. The California coastal region represents such a situation and is characterized by a narrow strip of cold water which exerts a strong effect on the climate of the region. Surface anomalies may be used as indicators of upwelling, but the mere presence of anomalies does not necessarily indicate the existence of upwelling. Similar effects have been caused temporarily by wind mixing or baroclinic adjustment of the density field associated with an increase in the geostrophic transport of a current. Persistence of the indicators, however, is probably possible only with upwelling [21].

The vertical advection of denser waters to the surface leads to a change in the distribution of mass, and, as the upwelled water accumulates along the coast, a current is established that flows in the direction of the wind along the coast to the south [23, p. 501].

C. OBJECTIVE

The objective of the present study is to examine the effects of upwelling on a central California coastal region, to compare the observed data to that obtained earlier, and finally to compare the various individual parameters observed. Achievement of these objectives was thought to

be best accomplished by a close examination of the region which includes the area between Monterey and San Francisco Bays. The region, still highly productive inshore, once supported a large fishing fleet, which moved to other areas when the sardines disappeared.

The constancy of climate in the area encourages population growth and tourism. The increased numbers of people represent an ever increasing demand on the coastal communities for waste disposal. The coastal communities of central California can be divided into two types: a highly industrial megalopolis to the north and a suburban and rural area to the south.

The area is affected by the flow of the largest river system in California, which empites into San Francisco Bay and is subsequently discharged into the sea. The region has been previously examined by Labyak [11] and Baker [1], whose data, especially Labyak's for May 1969, was hoped to be useful in establishing comparisons.

Comparisons were made between the physical and chemical variables observed during the cruise, which lasted from 29 April to 5 May 1970. The observed ranges for these parameters were large due in part to several significant plankton blooms which were observed.

II. OBSERVATIONAL PROCEDURES

A. STATION LOCATIONS

Station data were collected during the period 29 April - 5 May 1970 aboard the USNS BARTLETT (T-AGOR-13). The area under investigation, the coastal region between Monterey Bay and San Francisco Bay, is presented in Figure 2 along with the locations of the eighty-five stations occupied. The position, the time, and the weather conditions at each station are presented in Table I. The stations in this coastal region were chosen to cover approximately the same areas and stations covered by Baker [1] and Labyak [11] in order to increase the data available for this important region. Station lines were occupied in alphabetical order starting with station A-1 in Monterey Bay and ending with station M-7 to the south of the entrance to San Francisco Bay. Stations within a given station line were occupied in numerical order. Station positions were determined by radar, loran, and visual means to within an accuracy of from 0.5 to 1.0 nmi.

B. DATA COLLECTION

Three hydrographic casts were made at each station. On the first cast, the beam transmissometer and the sound velocity/temperature/depth probe (SV/T/D) were arranged to allow the beam transmissometer to pass through essentially undisturbed water (Figure 1). Variations of temperature, transmissivity, and sound velocity as functions of depth were observed on both the down and up portions of each cast. The readings recorded here, however, are from the down cast only, because both the probe and transmissometer were allowed to remain for some time at a given depth and allowed to equillibrate.

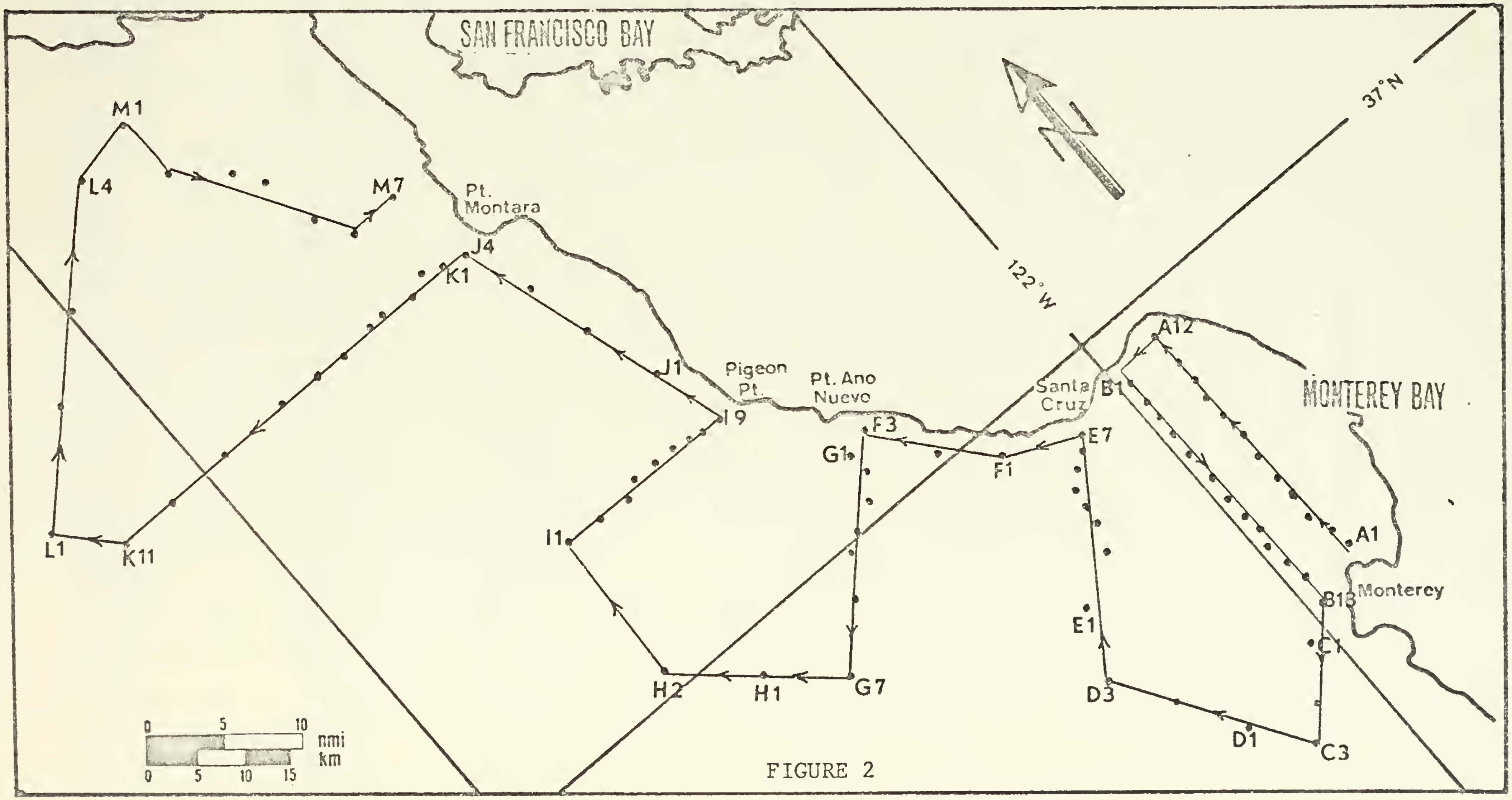

FIGURE 2

Cruise Track Showing Station Locations.

Continuous readings observed on the up cast provided insight into the structure of the water column, but the readings were consistently lower than for the down cast due to lack of time to reach equillibration and due to the passage of the instrument through disturbed water. The transmissivity record was examined to determine optimum depths for locations of sample bottles on the second cast. Expendable and mechanical BT's were taken at various stations to check the calibration of the SV/T/D probe.

On the second cast water samples were collected with Nansen bottles without reversing thermometers and were divided into five groups: (1) 250 ml for oxygen analysis, (2) 100 ml for phosphate analysis, (3) 320 ml for salinity determination, (4) 120 ml for particulate analysis, and (5) the remainder for chlorophyll _a_ determination. The oxygen and phosphate analyses were performed aboard the BARTLETT. The particulate samples were placed in 120 ml polyethylene bottles to which 3 ml of Lugol's iodine solution was added by means of an automatic syringe.[1] The samples for chlorophyll _a_ determinations were filtered through a Whatman GF/C glass fiber filter on which a small amount of $MgCO_3$ had been placed. The filter papers were folded in half with the filtrate on the inside to prevent loss, hermetically sealed in plastic bags, and immediately frozen.

The third cast was made with a bottom sampler [11] to collect near bottom water samples for particulate, phosphate, and salinity analyses.

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[1] The formula for Lugol's iodine solution is: 1 g I and 3 g KI per 300 ml distilled water. The resulting solution is filtered through 0.22 μ Millipore filters and stored in a dark bottle.

C. INSTRUMENTATION

1. Beam Transmissometer

Throughout the cruise observations of light transmissivity were obtained by means of a Marine Advisors Model C-2 beam transmissometer (alpha-meter). This instrument is the same one used by Labyak [11] and Baker [1] and is similar to the one described by Yeske and Waer [26]. A tungsten lamp was used as the light source, and the optical pass-band was determined by a combination of Wratten 61 and Schott BG-18 filters which also eliminated wavelengths in the infrared during air calibration.

2. Sound Velocity-Temperature-Depth Probe

A Ramsey Engineering Company MK-1 Deep Sea sound velocity-temperature-depth (SV/T/D) probe was used at practically every station during the cruise. The instrument is described by Labyak [11].

3. Fluorometer

A Turner Model 111 fluorometer was used in the analysis for chlorophyll a. The fluorometer was used with a blue Corning CS.5-60 primary and a red Corning CS.2-64 secondary filter.

4. Particle Counter

Analysis for particulate matter in the sea water samples was accomplished using a Model T Coulter counter to size the particles electrically. The counter separates particle sizes into fourteen size ranges or channels. The data output is on paper tape and is presented in four different modes: differential population, cumulative population, differential volume, and cumulative volume.

To calibrate the counter 3.49 μ polyvinyltoluene latex spheres were used. The calibration adjustment is set to give equal counts in two adjacent channels, so that the peak in the particle size distribution of the standard spheres occurs at the division between the two channels.

The location of the peak of the calibration standard and the aperture size determine the range of sizes which can be counted. The aperture size is most important, as it determines an absolute upper bound of particle diameters. In practice the lower bound results from electrical noise. The overall effective range of the counter for a 100 μ orifice, as it was used, was from 1.59 μ to 32.0 μ, corresponding to channels 13 to 0. Noise in channel 14, at the small size end of the range, prevented its use.

A proportionality constant can be computed to convert directly from a number of counts observed for a specific size range or channel number to an actual volume of particles in cubic microns (μ^3), which were drawn through the aperture:

$$K = V_d/(P_d \times \frac{\pi D^3}{6})$$

where:

k = constant of proportionality

V_d = differential volume (μ^3)

P_d = differential population

D = equivalent spherical diameter for the channel (μ).

It is to be emphasized that the particulates suspended in the sea are not regularly shaped and that sizes obtained with the Coulter counter or any such counter at best furnish "signatures" which are representative of the approximate particle volumes.

III. DATA ANALYSIS

A. INTRODUCTION

The distributions of temperature, phosphate, chlorophyll a, beam transmittance, oxygen, and suspended particulate matter,during upwelling off the California coast were studied in some detail. Of the observable oceanic parameters, temperature and salinity normally provide the best indication of upwelling in an area. Cold, saline, deep water which wells upward is easily detected. In the absence of either temperature or salinity data combinations of pairs of the above parameters, i.e., beam transmittance and particulate count, or oxygen and phosphate, may also be helpful in characterizing a water mass. Therefore to describe the region the observed data were plotted, and contours were drawn in vertical and horizontal sections for the six parameters listed above, using continuity of flow of the associated pairs of parameters as a check.

B. DESCRIPTIVE TECHNIQUES

1. Horizontal Contours

Horizontal layers at 0, 10, 20, 40, and 75 m were considered. The first four depths were chosen to coincide with and to allow comparisons with Labyak's data. The fifth level was chosen as 75 m rather than Labyak's 61 m in order to arrive at a better picture of the deeper, near-bottom waters. The parameters temperature, phosphate, beam transmittance, oxygen, particulates, and chlorophyll a, will be presented in this order, and each will be examined from the surface to 75 m.

The greatest horizontal gradients for all parameters occur at the surface. Predominant features occur in the surface layers at the southern end of Monterey Bay and off Point Pinos, in the northern end of the Bay

near Santa Cruz, in an area approximately 10 nm off Point Montara parallel to the coast, and west of the entrance to San Francisco Bay (Figures 10, 15, 20, 25, 30, 35).

The surface temperature section (Figure 30) shows the characteristic packed isotherms which are indicative of upwelling. The greatest horizontal gradient for the entire cruise, 0.25°C/nmi, was observed off Pigeon Point on roughly the same line of bearing as station line I. As successive levels are examined, it is seen that temperature increases with increasing distance from the coast and decreases with increasing depth. A predominant feature of the shallow, northern, inshore portion of Monterey Bay, in the region of stations A-10 through A-12, is its essentially isothermal water. The shallow water - the stations are within the 30 meter contour - responds quickly to solar heating, but there is no evidence of replenishment at depth with colder waters. This fact has been explained by Bolin and Abbott [3] as follows: In Monterey Bay colder water is welled upward to the surface and, in certain places, previously upwelled water may remain in local areas close to shore as circular eddies on the surface, particularly at the northern and southern ends of the Bay, and under these conditions solar heating raises the temperature of the body.

Examination of the phosphate contours (Figures 25 to 29) shows that there was a general decrease of fertile waters in the seaward direction due to the strong coastal upwelling experienced in the inshore regions. Anomalies in distribution, or patchiness, are probably due to high productivity, which depletes the supplies of nutrients in the euphotic zone. Such patchiness is to be expected of a non-conservative element in sea water. Phosphates exhibited an increase with depth, but no noticeable,

disproportionate increases were detected under areas of high productivity due to an increase of organic material which could be converted to phosphates through oxidization in situ of the detital material.

Beam transmittance contours for the layers 0 to 75 m (Figures 35 to 39) displayed the effects of coastal turbidity, runoff, and high productivity. Monterey Bay proved to be the most turbid region in the study area, which agrees with the observations made by Labyak during the same period. Values of light transmission were generally less than 30%/m for most of the Bay stations between the surface and 20 m, indicating the effects of the shallowness of inshore regions and of productivity. The 40 and 75 m contours showed that it is advection of water with high values of transmittance into the Bay at those depths, especially that water which travels over the Monterey Canyon where entrainment of sediments caused by the turbulent advection is not a factor, which contributes to the increased transmissivity of the waters.

Farther to the north, in the area around the entrance to San Francisco Bay, the effects of a flood tide and the resulting tidal currents on light transmission may be seen on the surface chart near stations M-2 and M-3 to the west of the entrance to the Bay (Figure 35). According to the tidal current chart for San Francisco Bay, the current at a point 5 miles west of the entrance of the bay is to the east (into the bay) and has a value of 0.8 knot one hour after maximum flood; two hours after maximum flood the current direction and set are 090^{o} and 0.5 knot respectively; three hours after maximum flood the direction changes to east-southeast and is reduced to 0.2 knot.

Station M-2 was occupied from 2320 to 2340 on 4 May 1970; and station M-3 was occupied from 0045 to 0102 on 5 May. The flood tide for

the Bay was a maximum at 2224 on 4 May; therefore, the tidal currents transport less turbid surface waters in toward the tidal prism, reducing the plume effect at the Bay entrance. It was expected that the waters in the vicinity of these stations (M-2 and M-3) would influence primarily the first few meters of the surface, because the Bay discharge is less dense, due to river outflow, and would spread out over the surface. The plots indicate this to be true, and show increased transmissivity at the 10 and 20 m levels.

Transmissivity contours at 10, 20, 40 and 75 m in the region between Point Montara and Pigeon Point show a tongue of upwelled water of high transmissivity (Figures 36 to 39). This water below one of the most productive areas in the study exhibits increased light transmission with depth and to seaward.

It was on the contour plots for oxygen (Figures 15 to 19) that the four distinct areas, namely the northern and southern ends of Monterey Bay, the region between Point Montara and Pigeon Point approximately ten kilometers offshore, and the area west of the entrance to San Francisco Bay, were most noticeable. The regions above are "anomalous" in that they show high saturated values of dissolved oxygen for a given salinity and temperature. The positions of these areas coincide well with regions having relatively warm surface temperatures, which indicates there is no impingement of upwelling on these surface layers. The result is a more stable stratum in which phytoplankton may achieve maximum exposure to light and accelerate photosynthesis into bloom conditions.

The surface regions around Point Ano Nuevo and on the axis of the Monterey Canyon approximately eight miles from shore provide examples of "good" agreement of temperature and oxygen, that is, low temperature and

low oxygen. The stations off Point Ano Nuevo show for oxygen an increase, then the expected decrease with depth. The "anomalous" increase in dissolved oxygen at ten meters may be attributed to the mixing and entrainment of photosynthetically enriched water.

Although salinity data are not yet available from the April-May 1970 cruise, the ten year mean value of 33.50‰ [5] was assumed to hold for the entire region and the percentage saturation of oxygen for the waters in the four areas of special interest was computed. The maximum values observed were at stations I-5, K-2, K-3 and K-4; these values of dissolved oxygen, all above 10 ml/l, gave corresponding saturation values between 173 and 179%. At the northern end of Monterey Bay and in the Santa Cruz region a percent saturation of from 115 to 139% was calculated. The southern end of the Bay and the Point Pinos region exhibited values ranging from 118 to 154%. Finally, in the region encompassing stations L-3 through M-2 to the west of the entrance of San Francisco Bay the percent saturation values were between 135 and 152%. These may be contrasted with the value of saturation for the surface water off Point Ano Nuevo, which was at 81% of saturation.

The rather high concentrations for dissolved oxygen agree with concurrent, independent observations of oxygen made on CALCOFI cruises on 29 April and 8 May 1970. The levels of dissolved oxygen determined during the California Cooperative Oceanic Fisheries Investigations cruise are shown in Figure 3 alongside the circles which mark the CALCOFI station locations. The NPS stations closest to these are indicated by crosses, and the values of dissolved oxygen are shown within parenthesis.

Examination of the tabulated oxygen data reveals a subsurface oxygen maximum for 56% of the stations. The existence of the maximum

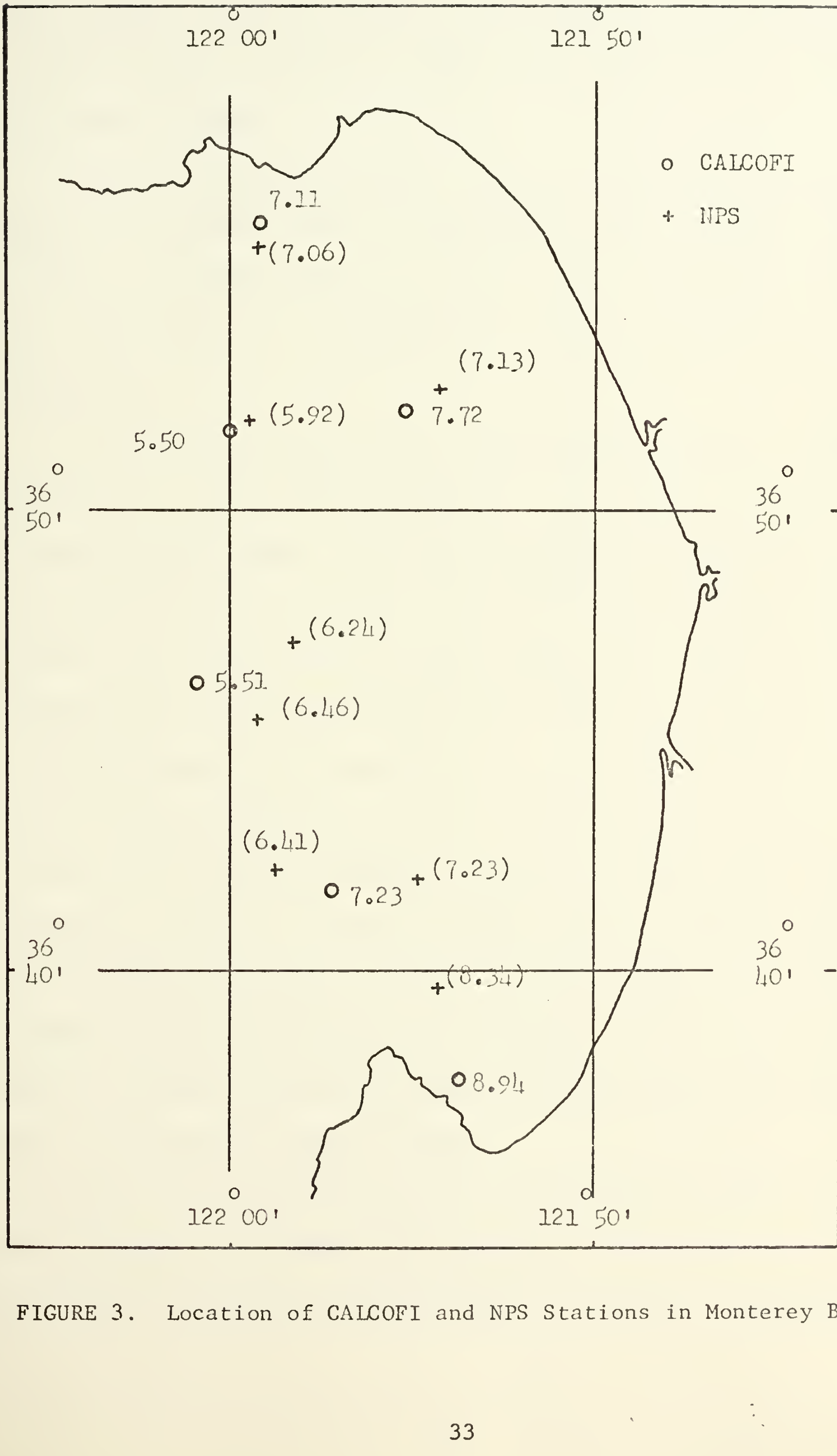


FIGURE 3. Location of CALCOFI and NPS Stations in Monterey Bay.

is in agreement with the findings of Pytkowicz [16] and of Stefansson and Richards [22]. However it is evident, even though no sigma-t data is yet available, that the origin of this oxygen maximum, especially in the inshore regions, is due to a higher rate of escape than productivity in the surface layers.

When the horizontal contours of total particulate count per 2 ml sample for the present cruise are compared to those of Labyak [11] for May 1969, it is apparent that not only were the maximum counts greater for the 1970 cruise, but also the areas of observed maximum counts were more numerous.

The present contours suggest that there are regions of high counts. The positions of four of these correspond to the regions of high chlorophyll and dissolved oxygen. The surface layer at the southern end of Monterey Bay exhibits lower total counts than any of the other four locations, but a comparison of the same regions at a depth of 10 m shows an increase with depth for the Bay station while for the others, counts decreased with depth. For the fifth area, the surface waters in the vicinity of Point Ano Nuevo, there was a high particulate count, which is assumed to be localized upwelling impinging on the surface. Also, low temperatures, oxygen poor waters and high values of chlorophyll were present near Point Ano Nuevo. The area does not appear to have been a previously localized photosynthetically productive area which had been overturned because of the high values of phosphate which would have had to have been depleted by photosynthesis.

Labyak [11] observed two areas of particulate maxima: a) a relatively large region between the entrance to San Francisco Bay and Pigeon Point, the greatest seaward extent of which was approximately

25 nmi, and b) a localized offshore area in the vicinity of Point Ano Nuevo of approximate dimensions 5 x 10 nmi. The observations he conducted in the Monterey Bay region indicated low particle counts. Since the counts observed were roughly two orders of magnitude lower than those obtained in the present study, a plausible explanation was sought. A comparison was made of the areas of particulate maxima off Point Montara which occurred in 1969 as well as 1970. Because of the large difference between Labyak's data and that for April-May 1970, it was decided to reanalyze some of the particulate samples taken on Labyak's cruise with the Model T Coulter counter to establish a better comparison between the two sets of data.

Selected samples from the observed maxima at Labyak's stations N-8, N-9, and N-10, where counts of approximately 5000 were reported, were reanalyzed. The samples had been sealed and stored for more than a year and a large concentration of particles was observed in each analysis as follows: optically, physically, in the number of blockages that resulted, and electronically, in the high cumulative count which ranged from 83-114 x 10^3.

If the number of particles is assumed to have remained constant in storage, then a comparison of the former and present observations can be made. An examination of the Coulter counter print-out reveals that a cumulative count of 5000 corresponds to channel number 6, and an equivalent spherical diameter of 8.0 μ. This seems to indicate that Labyak was probably counting only those particles greater in size than approximately 8.0 μ, and the contours for the particulate data obtained on the May 1969 cruise should be used only in a relative sense.

Surface concentrations of chlorophyll a were quite variable throughout the region, but the highest were to be found near Point Pinos,

off Santa Cruz, off Point Montara, and to the west of the entrance to San Francisco Bay (Figure 10). Maxima were, in general, confined to the first 10 m or so with unusually high values of chlorophyll a observed in a few instances at greater depths. This may be explained in terms of a cessation of upwelling or a change in the sinking rate of the phytoplankton. With a previous cessation or slackening of vertical advection, dense upwelled water sinks, and the entrained phytoplankton also sink. This process may well have occurred near station K-5 where an isolated pocket having a high chlorophyll a content exists at 55 m. At the same depth are to be found high particle count and low light transmission (Figures 70, 72, and 75). If the process cannot be explained by a slackening of upwelling, it is perhaps best explained by a mechanism proposed by Margalef, i.e., changes in the sinking rate of phytoplankton produce concentrations and rarefactions of populations at different levels [13].

2. Vertical Contours

Vertical sections were drawn for station lines A, B, E, G, I, K, and M (Figures 40 to 81). Contours were drawn to the data at each station in a given line from the surface to 100 m, except where interrupted by the bottom. Each of these station lines was contoured for the following six parameters: chlorophyll, oxygen, particulates, phosphates, temperature, and light (beam) transmittance.

The influence of the Monterey Submarine Canyon on the parameters observed in station lines A and B in Monterey Bay can be seen in the contours. Bolin and Abbott [3] indicated that the Canyon channels the flow of upwelling water into the Bay, and that deep water follows the axis of this topographic feature and then flows out of the Canyon into the shallow

regions to the north and south. The 40 and 75 m isopleths of transmittance, temperature, and oxygen (Figures 41, 44, 45, 46, 50, and 51) show this effect in the Canyon and tend to confirm their suggestion. The first 20 m at the northern and southern ends of the Bay are oxygen-rich, nutrient-poor, highly productive, turbid, and possess high particle counts (Figures 40 to 51, less 44 and 50). The northern end of the Bay is essentially isothermal (Figures 44 and 50), a feature which was explained [3] as due to a circular eddy of previously upwelled water which is heated by solar radiation. The effects of upwelling can be seen more easily for station line E than for the Bay stations. There, sharply rising isopleths of transmissivity, phosphate, temperature, and oxygen are found (Figures 53, 55, 56 and 57). Productivity in the inshore regions is evident in the first 10 or 20 m in the area from E-7 to E-5, especially the first few meters around station E-6 (Figures 52, 53, 54, 55 and 57). The 3 m depth, in particular, has associated with it one of the largest values of chlorophyll a observed on the cruise, 11.98 gm/m^3, high particle count, high oxygen content, low transmissivity, and relatively high temperatures. A temperature inversion can be seen at station E-4 at a depth of 3 m. A similar occurrence has been noted during upwelling off the Oregon coast by Pak, Beardsley, and Smith [14].

The profile of chlorophyll at station line G has an unusual feature in that for the entire length of the line, approximately 14 miles, the concentration of chlorophyll a is above 2 mg/m^3 in the first 20 m, and, in a great portion of the area between 20 m and the surface, the concentration exceeds 4 mg/m^3 (Figure 58). The contours show upwelled water impinging on the surface layer in the vicinity of station G-2 and what appears to be a sinking of surface water at stations G-4 and G-5 (Figures 59 to 63).

Farther up the coast a great difference is found between the chlorophyll a content of the water from one end of station line I to the other (Figure 64) and is more characteristic of upwelling, in that the area of high productivity is near shore, and that there is a noticeable decrease of chlorophyll a seaward. Thus, almost uniformly low values of 0.5 mg/m^3 or less are found offshore. The high particle count observed (Figure 66) at station I-4 at 60 m is in conflict with other observed data. The high count may possibly be due to electrical interference. The high particulate counts, high oxygen, low transmissivity, low phosphate, and high chlorophyll a content in the warm, stable, surface layers indicate an extremely productive area between stations I-4 and I-9 (Figures 64 to 69). A similar situation is found between stations J-4 and K-5 (Figures 70 to 75).

The highest values of dissolved oxygen for the entire cruise were at the surface of the productive area off Point Montara. There, between 5 and 15 m is found, the greatest transmission gradient seen on the cruise (Figures 71 and 75). At station K-5, high particulate maximum, high chlorophyll, and low beam transmissivity are found at 55 m. These characteristics probably result from the sinking of phytoplankton.

Of all the station lines, M is the shallowest and probably most complicated in terms of both upwelling and tidal effects. As an aid to the interpretation of Figures 76 to 81 a time axis should be imagined as proceeding from left to right with slack water at or slightly after station M-3. The tide was at maximum flood at the time station M-1 was occupied. The tidal currents in the region are, according to the tidal current charts for San Francisco Bay, directed into the Bay until three hours after maximum flood at decreasing velocities until a slack is observed. Tidal currents advect the colder, oxygen poor, chlorophyll

deficient, nutrient-rich, ocean waters, which have higher light transmission and lower particle counts, in toward the Bay, drastically altering the distribution of parameters in the top 20 m.

The effect of the horizontal advection of water through the dischange plume for San Francisco Bay is exhibited as lower values of temperature, oxygen, chlorophyll a, and particulate count, and a general weakening of the surface layer gradient. At a time slightly after station M-3 was occupied a slackening and reversal of the tidal current occurred producing an increase in the horizontal gradient for the above parameters. The converse is true for light transmissivity and phosphate.

3. Graphical Comparisons

To establish logical comparisons between the data observed on the May 1970 cruise and that obtained from other sources, the cruise data were presented using the same display methods used previously for the same region. The remainder of the data are presented in simple scatter diagrams to provide comparative relationships between pairs of parameters.

While working with the Coulter counter, Bader [2] noticed that many natural collections of small particles, for example, suspended mineral and organic matter in sea water, have hyperbolic distributions. While observing the particle distribution in sea water samples from Little Bahama Bank, Bader found that if a log-log plot of equivalent spherical diameter in μ versus cumulative particle count is constructed, the results are linear with slopes of 0.88 - 1.45 counts /μ. For comparison with the present data a plot was constructed for the cleanest water observed on the cruise, that at station I-1 at a depth of 100 m (Figure 4), and the slope was calculated to be 0.82 counts /μ. Bader also observed the influence of slope on the shape of the plot, that

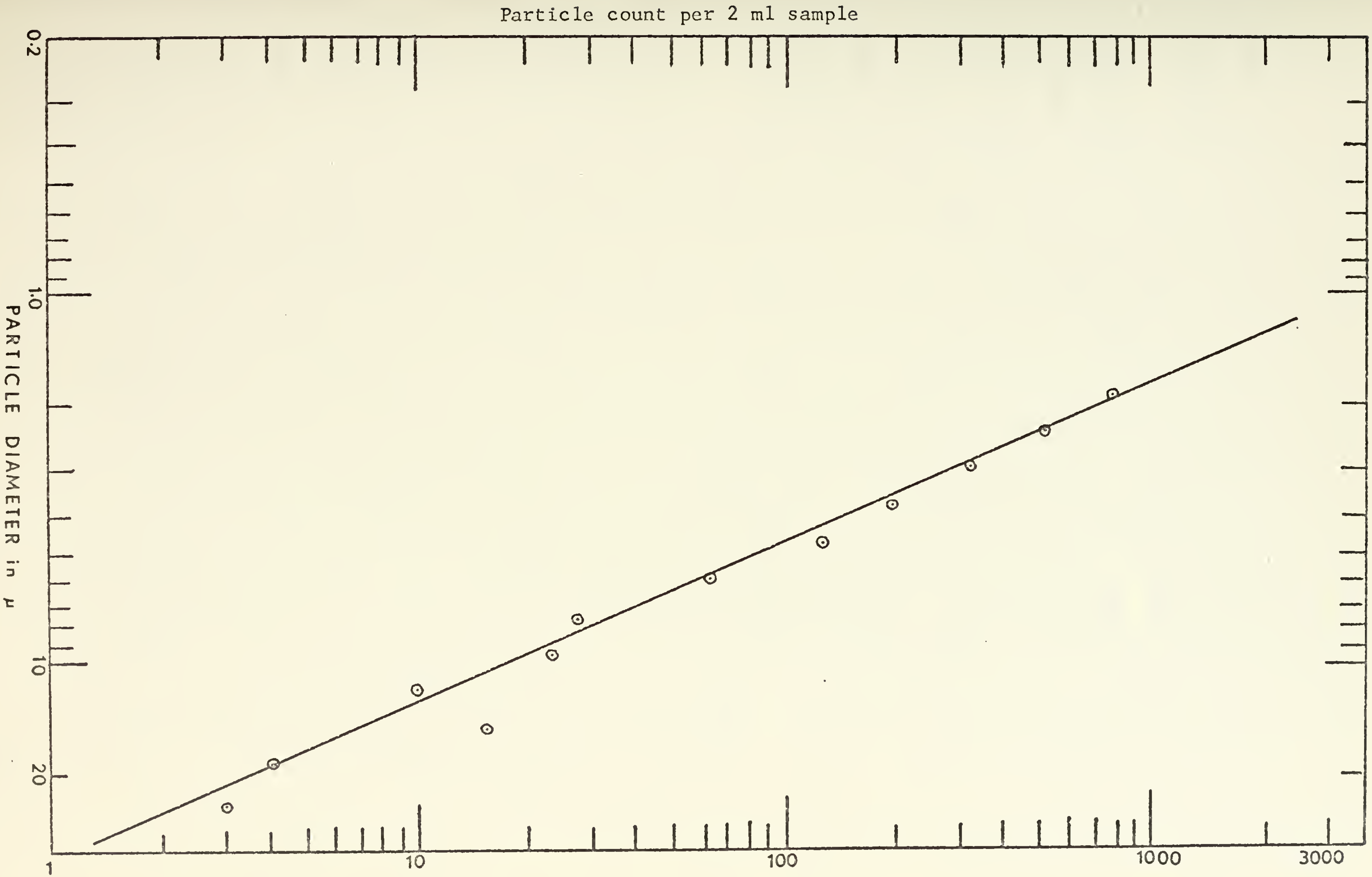


FIGURE 4. Particle Size Distribution Observed at Station I-1 at 100 m.

is, the larger the slope the greater the influence of small particles. Natural truncation occurs for large particle diameters due to a settling which takes place despite stirring, thus causing a change in slope and producing a distinct bend at a particular equivalent spherical diameter.

To examine this natural truncation plots similar to Figure 4 were constructed for depths from 0 - 100 m. Station A-6 was chosen as typically representative of the Monterey Bay region. Examination of the plot (Figure 5) reveals an abrupt change in slope and a dip at a particular size. This seems to indicate the presence of larger amounts of particles of this size than would normally be observed. The peak occurs at approximately 15 μ, which is within the nannoplankton range. It is assumed, therefore, that the peak which is evident in the surface layers only is due to an abrupt increase in phytoplankters.

Chlorophyll a was plotted against oxygen in Figure 6. An initial plot of selected stations showed that there was no correlation in the scatter of points from the plotted values at each station: values of high chlorophyll a were observed at both low and high values of dissolved oxygen. Some of the high values of chlorophyll a corresponding to low oxygen may be explained by the presence of detritic pigments and/or by inactivation of chlorophyll a as phaeophytin [13]. One hundred percent saturation of dissolved oxygen is assumed to occur at 6.0 ml/l - a value which is approximately correct for the region considered. All values in excess of this were plotted, but no apparent relationship was revealed between O_2 and chlorophyll a. More than 70% of the values greater than 6.0 ml/l were associated with chlorophyll a concentrations of 2.0 mg/m^3. Of the low values of chlorophyll a above saturation, 80% were associated with offshore stations removed from the effects of upwelling. It is

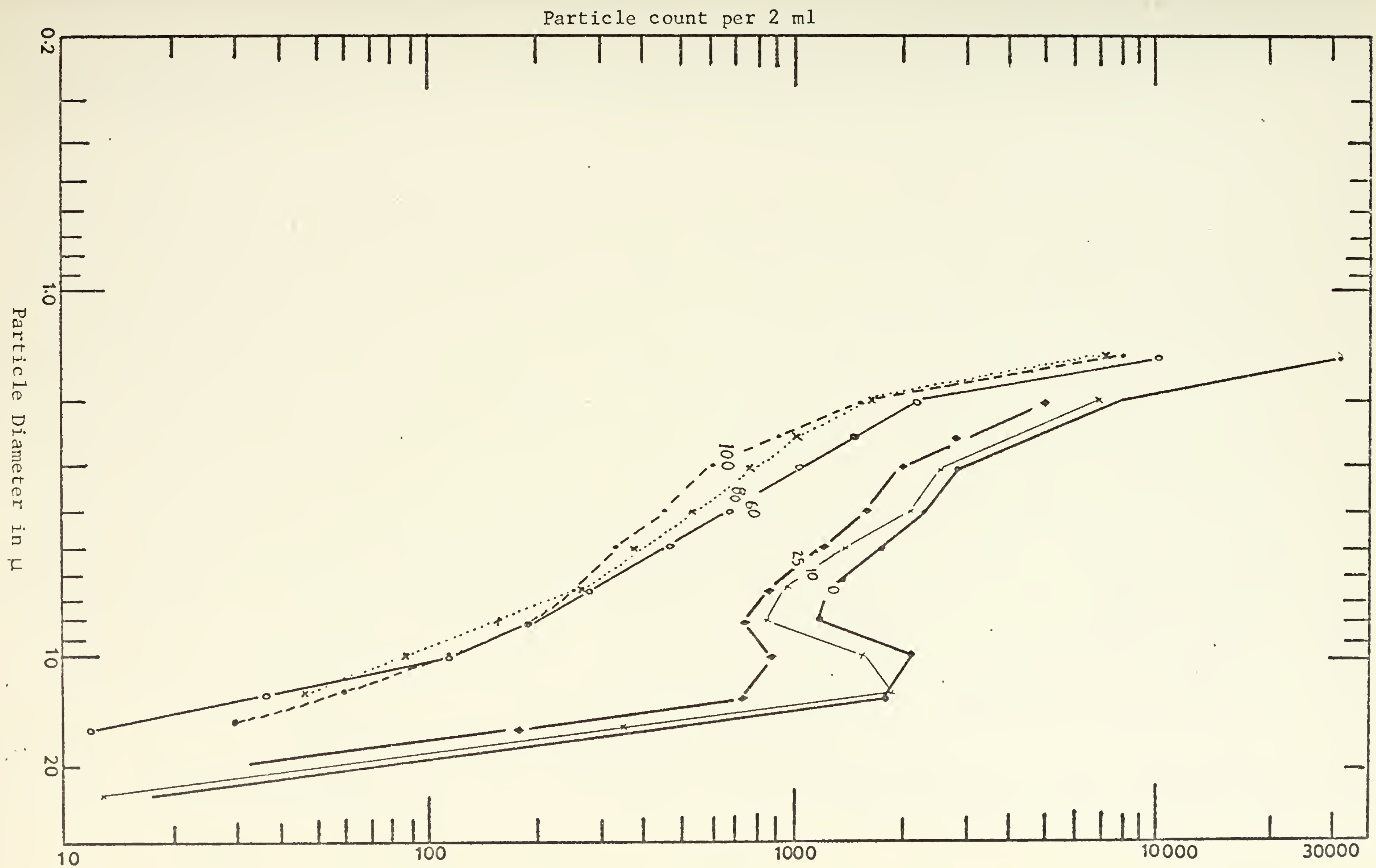


FIGURE 5. Particle Size Distributions Observed at Station A-6 in Monterey Bay, from 0 - 100 m.

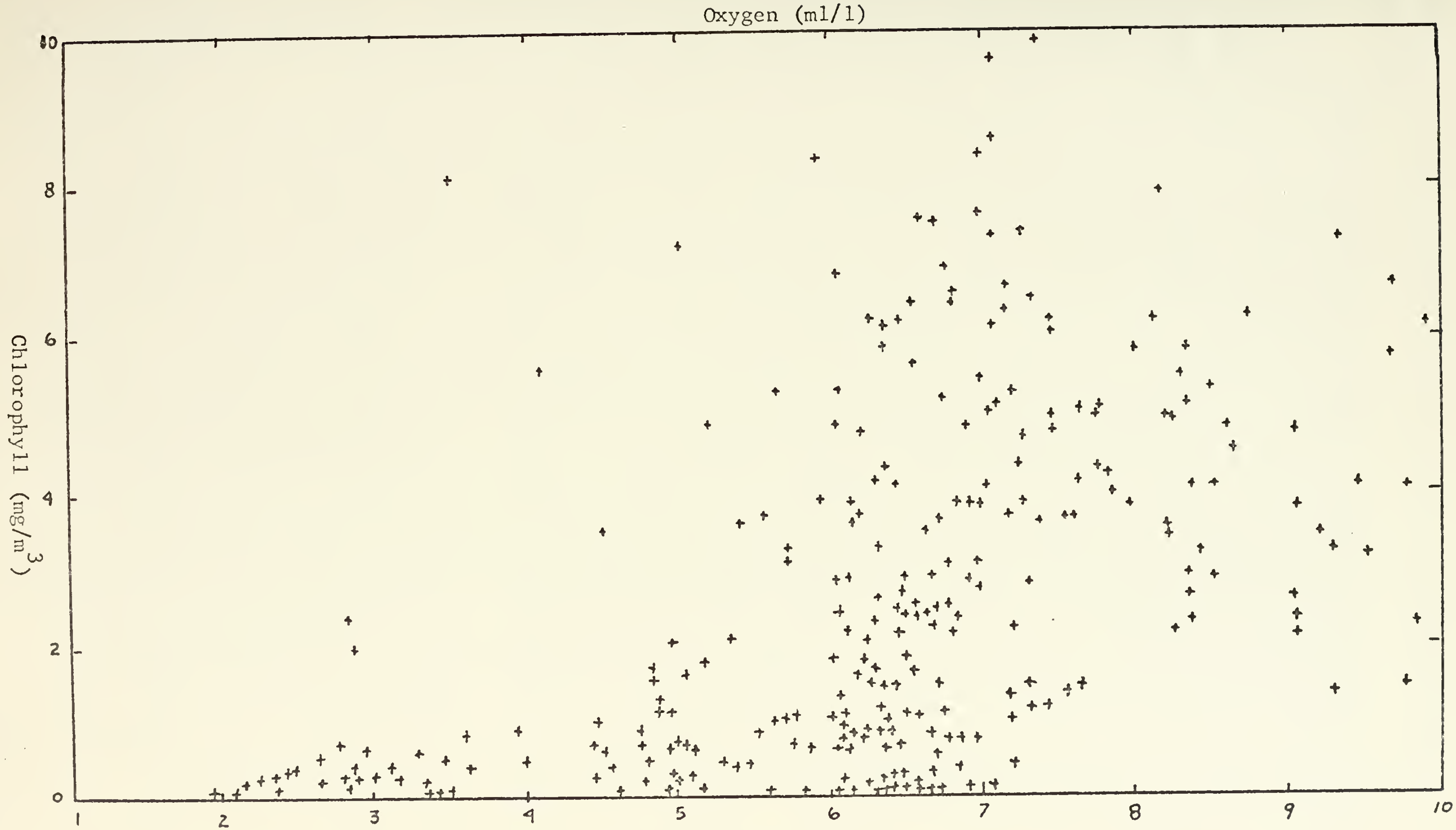


FIGURE 6. Chlorophyll a as a Function of Oxygen.

assumed that these values are due to wind mixing which homogenized the water mass.

It has been shown above that in general the regions of high total particulate count were areas of low light transmissivity. Therefore, a scatter diagram was constructed to see if obvious correlation did exist between the two parameters. Values of beam transmittance were plotted against total counts per 2 ml sample for all depths for each of the stations in Monterey Bay as well as for selected stations throughout the entire cruise region, and a fair linear correlation was exhibited between the two. The plot (Figure 7) shows that in general low particle counts accompany high values of beam transmission and conversely, high particle counts are associated with low beam transmission. A few extremely high counts were noted in association with high transmissivity, but it is believed that these values possibly may be due to counting error. If these values are included in the range of counts for a given value of beam transmission then a spread of approximately 35,000 counts occurs at an arbitrary value of transmissivity. A similar range of values exists for low beam transmission. However, it is to be expected that the higher the count, the lower the beam transmission, especially where high counts are concerned.

Beam transmittance was also plotted against chlorophyll a for stations A-1 through E-5. This covered the Monterey Bay area and the southern portion of the study region, and it was hoped that the more than 200 points would show relationships between the two parameters. Figure 8 depicts a rather limited relationship between the two and shows that high light transmissivity is not associated with high concentrations of chlorophyll a. Indeed the chlorophyll a concentration appears to determine the upper limit of beam transmission. The fact that there is no

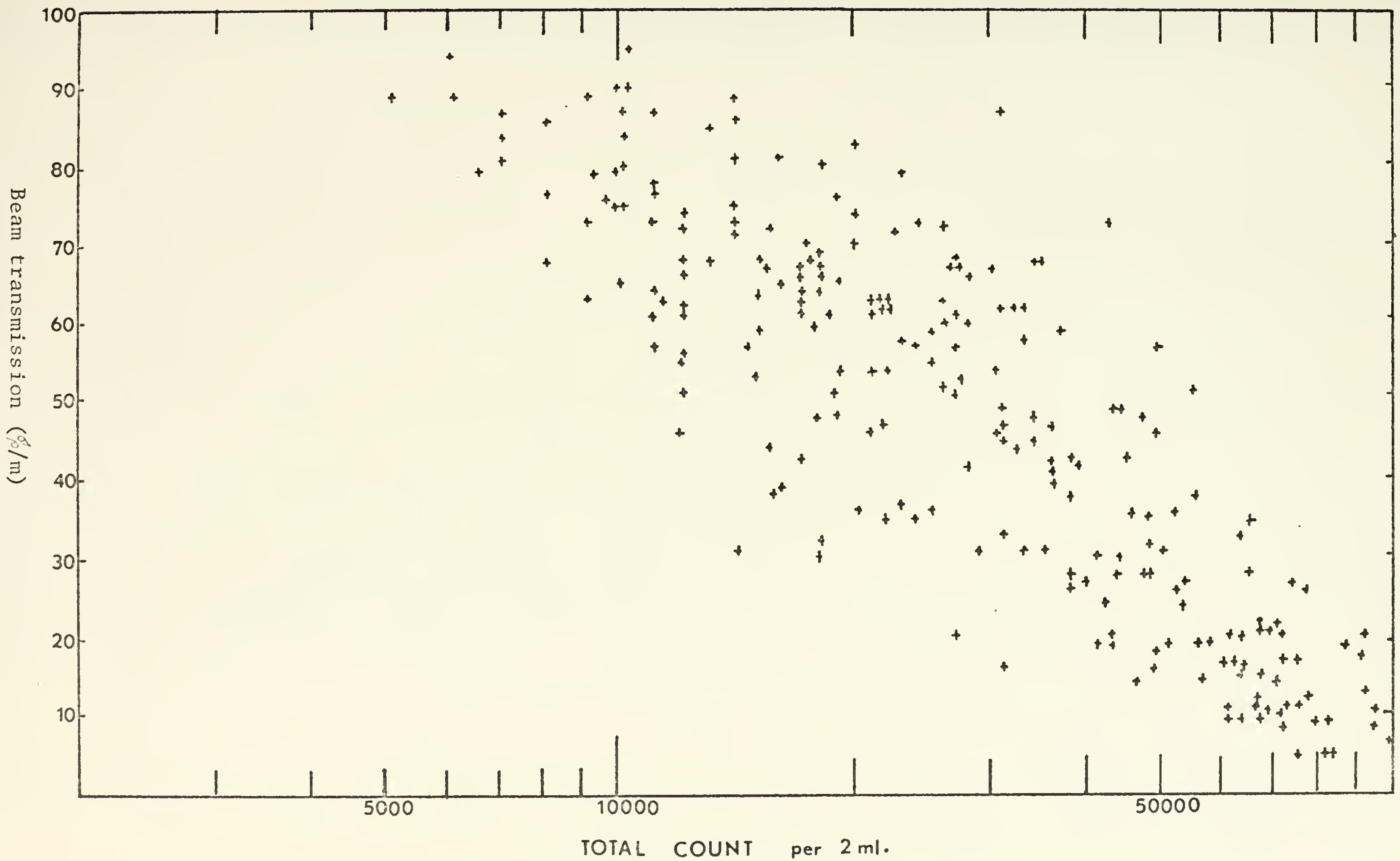


FIGURE 7. Total Particle count as a Function of Beam Transmittance.

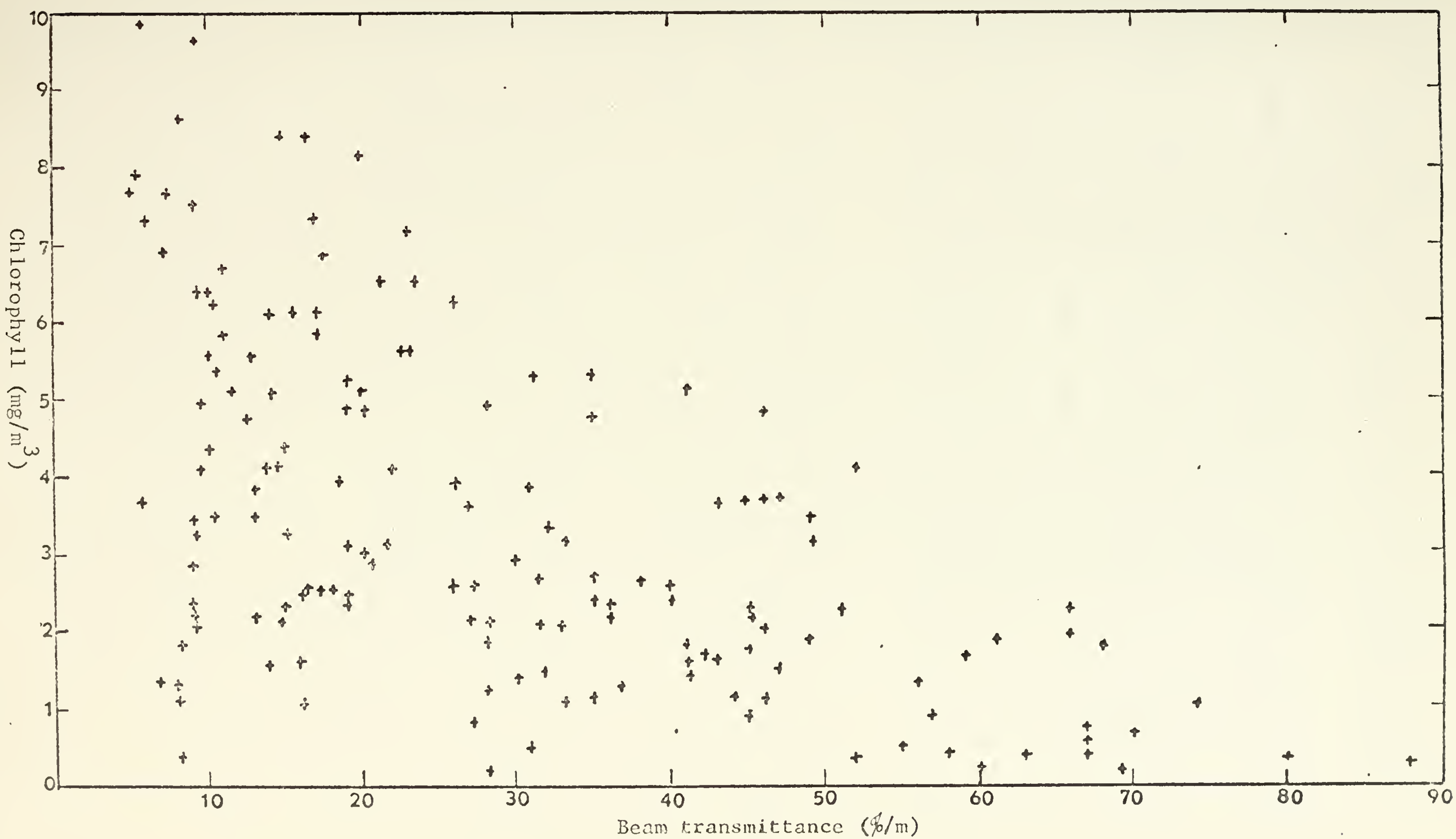


FIGURE 8. Beam Transmittance as a function of Chlorophyll a.

lower limit of light transmission for a given chlorophyll a concentration indicates that other factors - such as dissolved organic material - also play a role.

Pytkowicz [16] observed relationships between phosphate and oxygen from the surface to 1000 m off Oregon before upwelling, at the approximate onset of upwelling, and after upwelling had been established. He assumed that if water was affected by biochemical reactions only, the slope was fixed , and if water masses characterized by differing oxygen - phosphate relations were present in varying amounts, then the slope of the linear line would change depending on the proportions of each. Varying slopes were recorded for each of the periods examined off the Oregon coast.

To investigate the possibility of the existence of such a relationship, a plot was constructed for three stations in an inshore region, namely J-1, J-2, and K-1, and for three stations offshore, L-1, K-10, and I-1. The results are shown in Figure 9. The inshore stations exhibited higher amounts of phosphate for a concentration of dissolved oxygen which shows the effect of upwelling. The offshore stations showed greater variability especially in the surface layers due to depletion without replenishment. Pytkowicz's best approximation to his data for the upwelling period is presented as a stippled line.

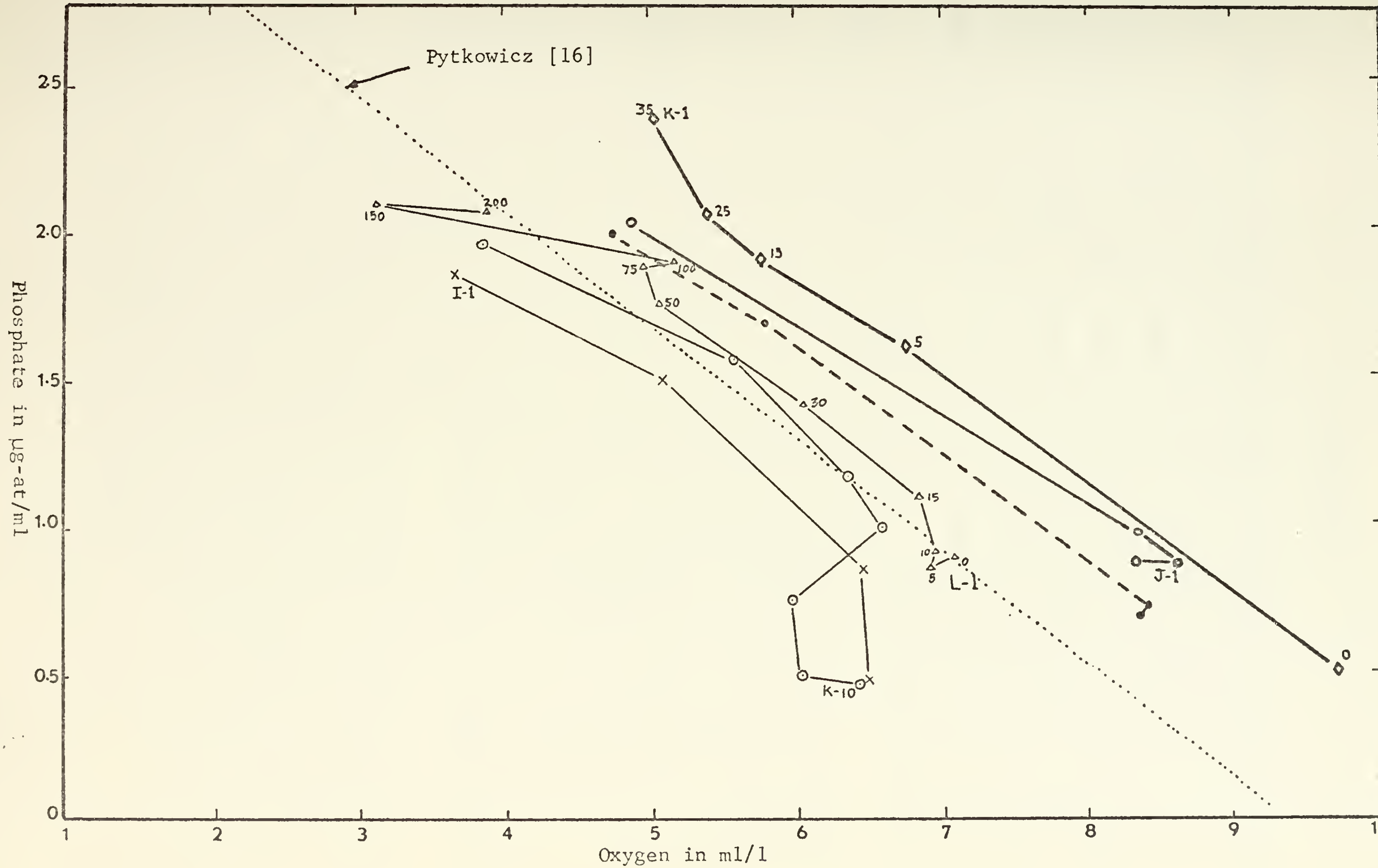


FIGURE 9. Oxygen as a function of Phosphate.

IV. CONCLUSIONS

Observations off the central coast of California have been conducted on a large scale by California Cooperative Oceanic Fisheries Investigations (CALCOFI) and by Hopkins Marine Station. This present study represents a fine scale survey of the central California region during an upwelling season. The analysis of data was approached in a quasi-synoptic manner, due to the spatial and temporal changes that took place during the observations. However, this method provided a broad subjective aid in understanding the upwelling process. From the data and the various modes of presentation it was concluded that:

(1) The region covered in the May 1970 cruise appears to be separated into four distinct regions: the southern end of Monterey Bay near Point Pinos, the northern end of the Bay near Santa Cruz, the region off Point Montara, and the area west of the entrance of San Francisco Bay. All stations within these regions exhibited high oxygen, high particulate count, low beam transmissivity, and high chlorophyll *a*. This is in contrast to the two productive regions found on the cruise of May 1969: off Point Ano Nuevo and an area the extent of which is larger than any of the regions in the recent cruise.

(2) Upwelling appeared to be stronger in the May 1970 cruise, which can be judged by comparing the surface isotherms decreasing adjacent to the coast. Labyak's 1969 data show isotherms decreasing seaward from 12°C along the coast to approximately 10.5°C and then another increase. The most recent data for the upwelling season show low temperatures along the coast as low as 9.5°C increasing seaward.

(3) A fair relationship exists between particle count and beam transmission. The particle counts observed in the analysis of 2 ml samples ranged from a total count of approximately 5000 for the cleanest water to in excess of 200,000 for very turbid water.

(4) The linear relationship that was observed by Bader and Gordon [2, 8] for particle distribution in sea water can be distorted in the nannoplankton range by productivity in the upper 10 m or so.

(5) A subsurface oxygen maximum exists for more than half of the stations, which is probably due to a greater escape than productive rate of dissolved oxygen.

(6) The spread of sizes of particles counted was from 1.59 μ to 32.0 μ.

(7) Unlike the results for saturation of oxygen (60-70%) observed by Park, Pattullo and Wyatt [15] for upwelling waters off the Oregon coast, most of the surface waters appear to be 100% saturated. The four productive areas listed in (1) above are super-saturated.

(8) Tidal currents in the vicinity of the entrance to San Francisco Bay affect the distribution of the parameters observed in the study, especially in the upper 15 m.

(9) The warm surface layers contain high oxygen, high chlorophyll a, and low nutrients, which indicate high productivity. There are also associated with these areas high particle counts and low transmissivity. The warm stable layers allow phytoplankton maximum exposure to light, and with strong thermal gradients below these layers appear also strong gradients for particles and for transmissivity. This is not the rule for all productive areas, because the profile of total Coulter count shows a tongue of water which exhibits high counts extending through the area of sharpest thermal gradient toward the bottom for station line A.

V. SUGGESTIONS FOR FUTURE RESEARCH

There is a distinct lack of data, both raw and processed, for the region described in the study. Still more data are needed to fill this void. The following recommendations are made:

The fluorometric analysis for chlorophyll should be broadened to include a determination of phaeophytin. This would enable high pigment to oxygen ratios to be explained in terms of an inactivation of the chlorophyll a as phaeophytin. Weekly analyses of chlorophyll a could be run with a continuous reading fluorometer for the Monterey Bay region. These determinations could be made to coincide with spectrophotometric analyses of a larger area from an aircraft. Since an NPS aircraft is already modified for photography, slight additional modifications would allow a rapid determination of surface productivity after an overflight of a surface ship for calibration. In addition to a continuous fluorometric analysis, plankton tows should be obtained in areas of high productivity to identify which species lead to the high observed concentrations.

Since diurnal variations have been observed for both chlorophyll a and for phosphate, hourly observations should be made for a 24 hour period at an anchor station to observe possible variations of these parameters in Monterey Bay.

A more complete study of the nutrients of the area could determine the concentrations of silicates, phosphates, and nitrates, and the effect of each on productivity in the region.

The sigma-t profile for the area, especially during upwelling, should be studied to determine the effects of vertical advection on the water

column and to investigate offshore sinking of more dense water along isentropic surfaces. The sigma-t data should then be examined to see if possible relationships exist with oxygen, both below the surface layer and in regions of particulate maxima. Additional samples should be taken from areas of past particulate maxima to observe light scattering, and possible relationships between scattering and particle size distribution should be investigated.

Finally, cumulative volumes of particulates should be compared with the beam attenuation coefficient to see if possibly a better relation cannot be obtained than that between beam transmission and total count shown in Figure 7.

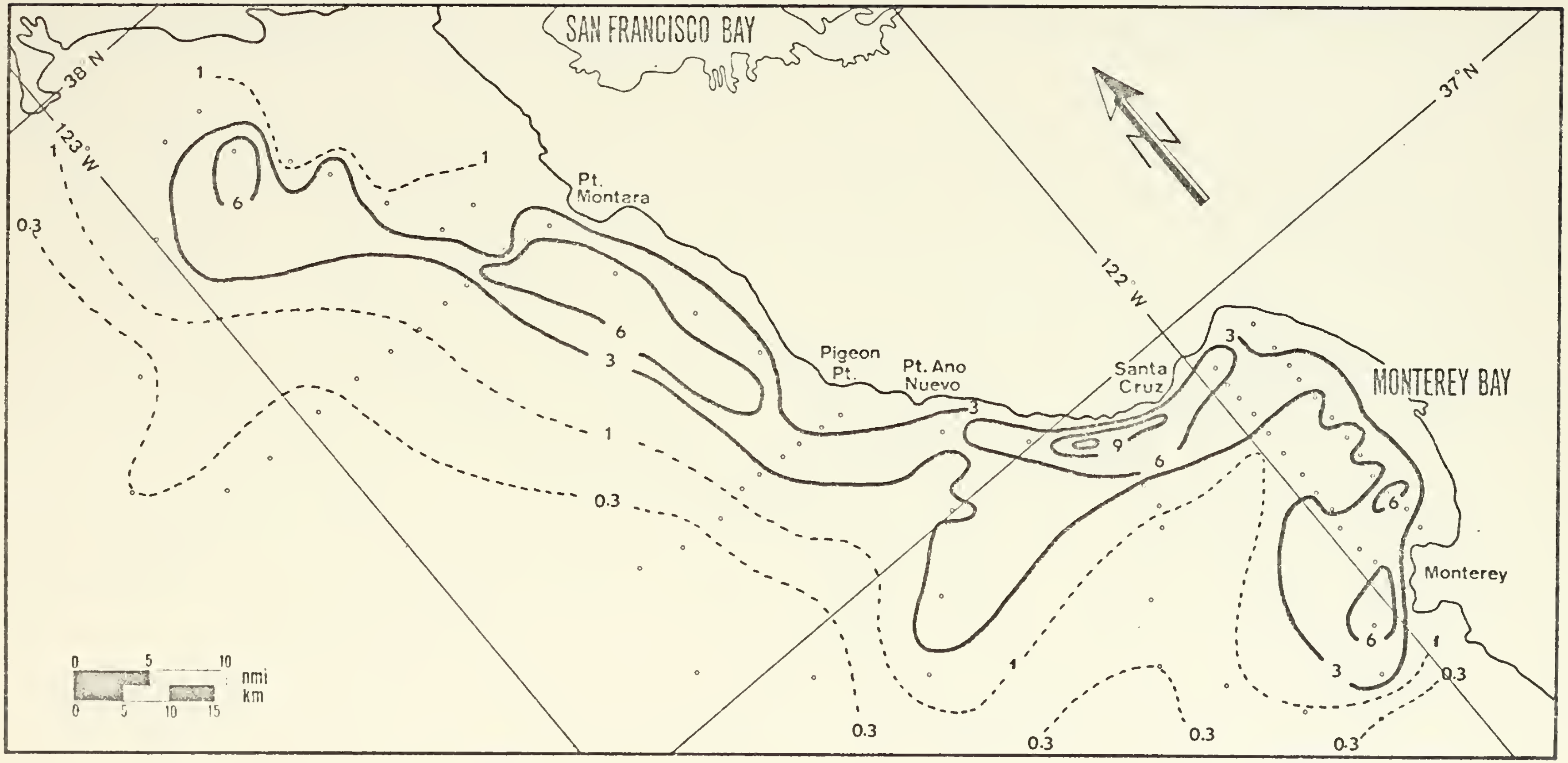


FIGURE 10. Surface Isopleths of Chlorophyll a (mg/m^3)

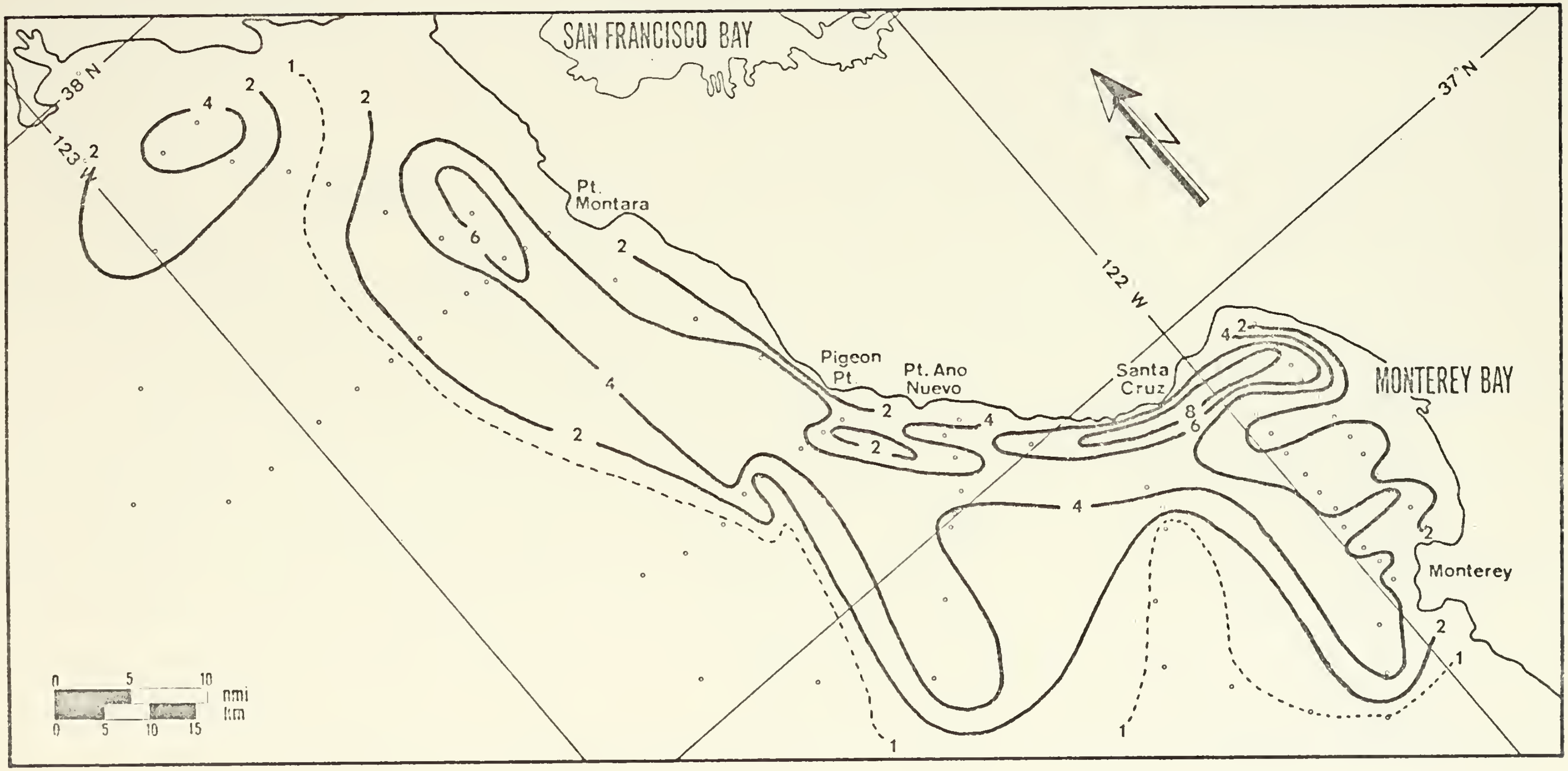


FIGURE 11. 10 m Isopleths of Chlorophyll a (mg/m^3)

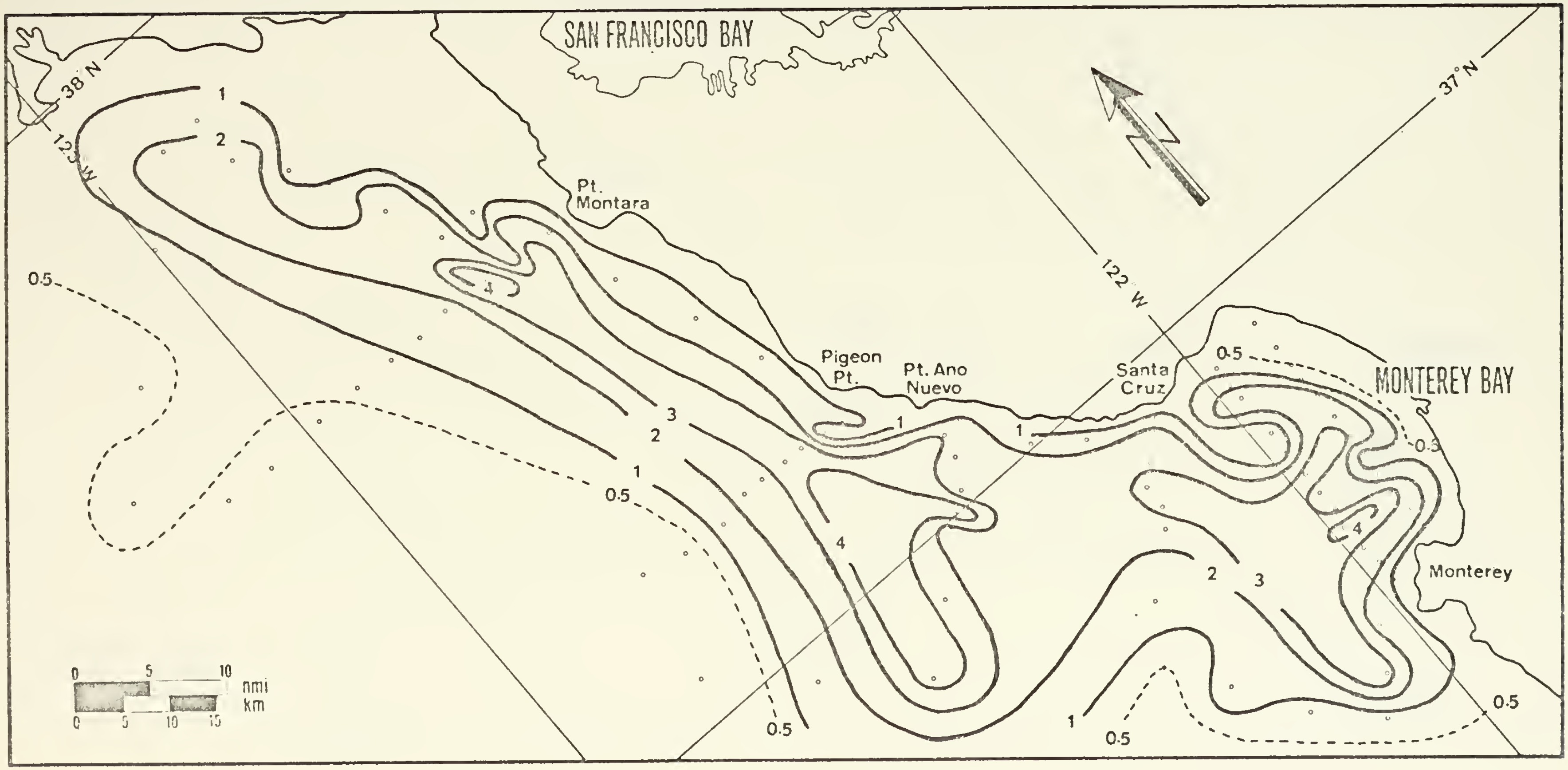


FIGURE 12. 20 m Isopleths of Chlorophyll a (mg/m^3)

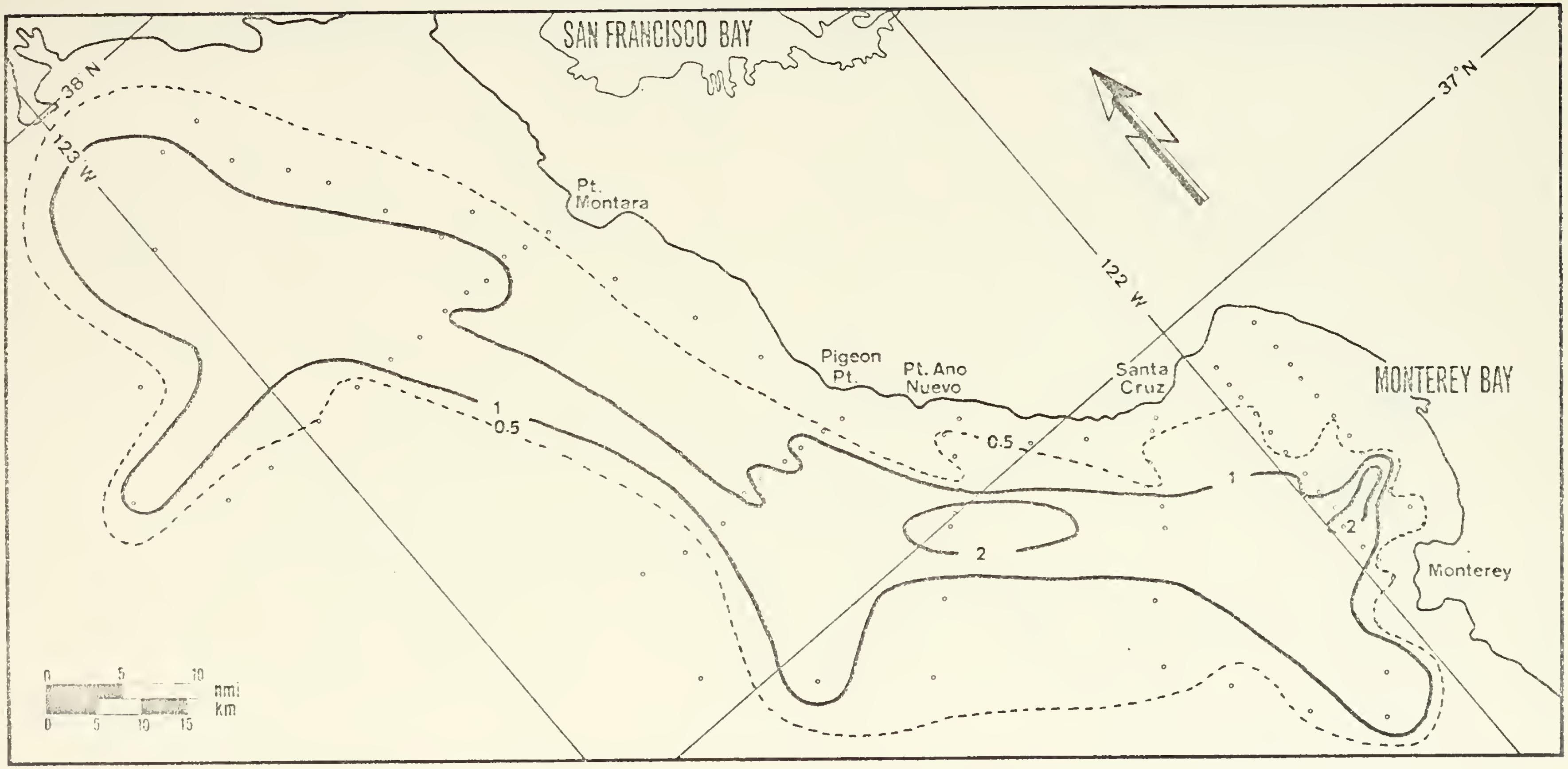


FIGURE 13. 40 m Isopleths of Chlorophyll a (mg/m^3)

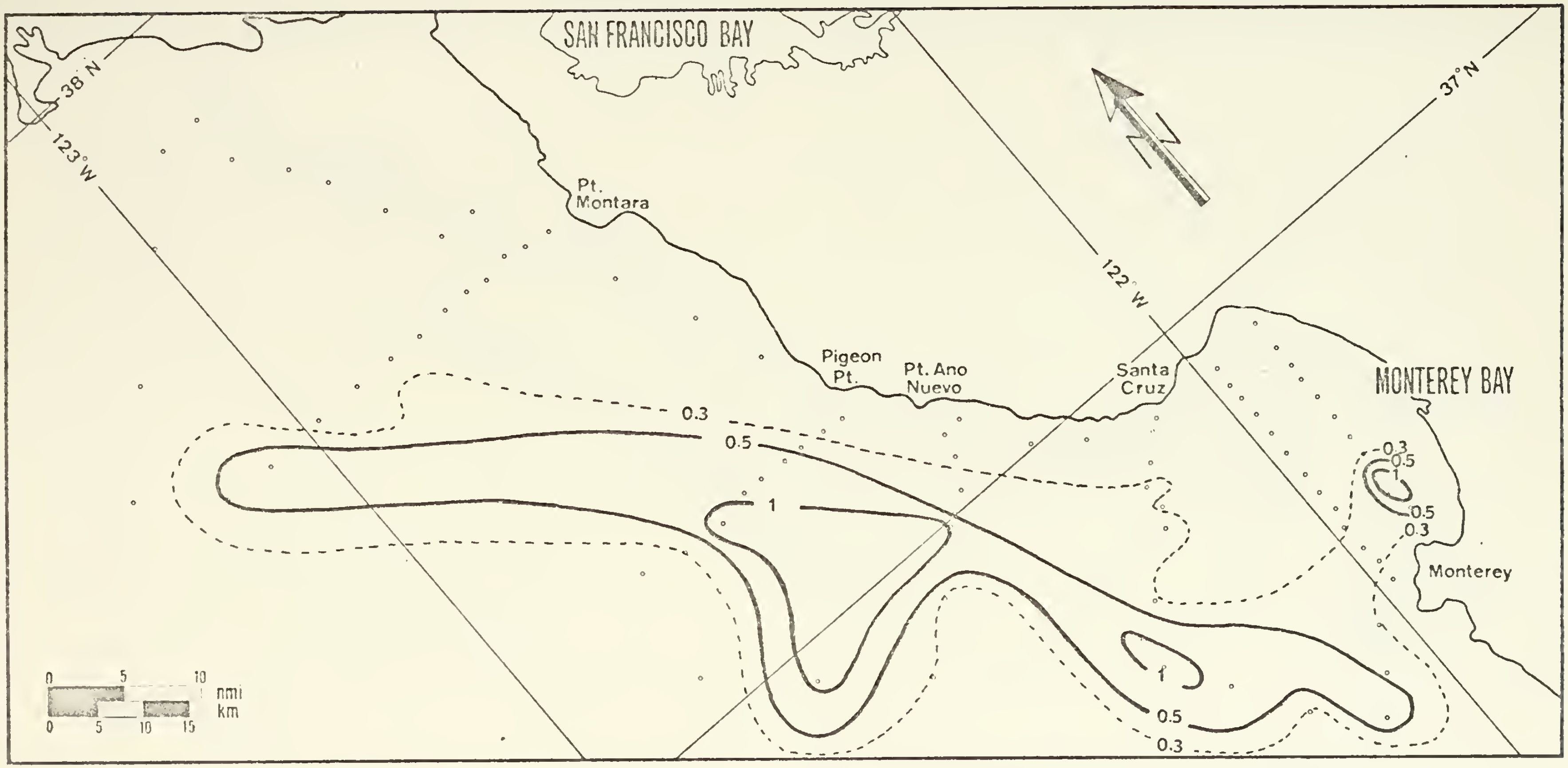


FIGURE 14. 75 m Isopleths of Chlorophyll a (mg/m^3)

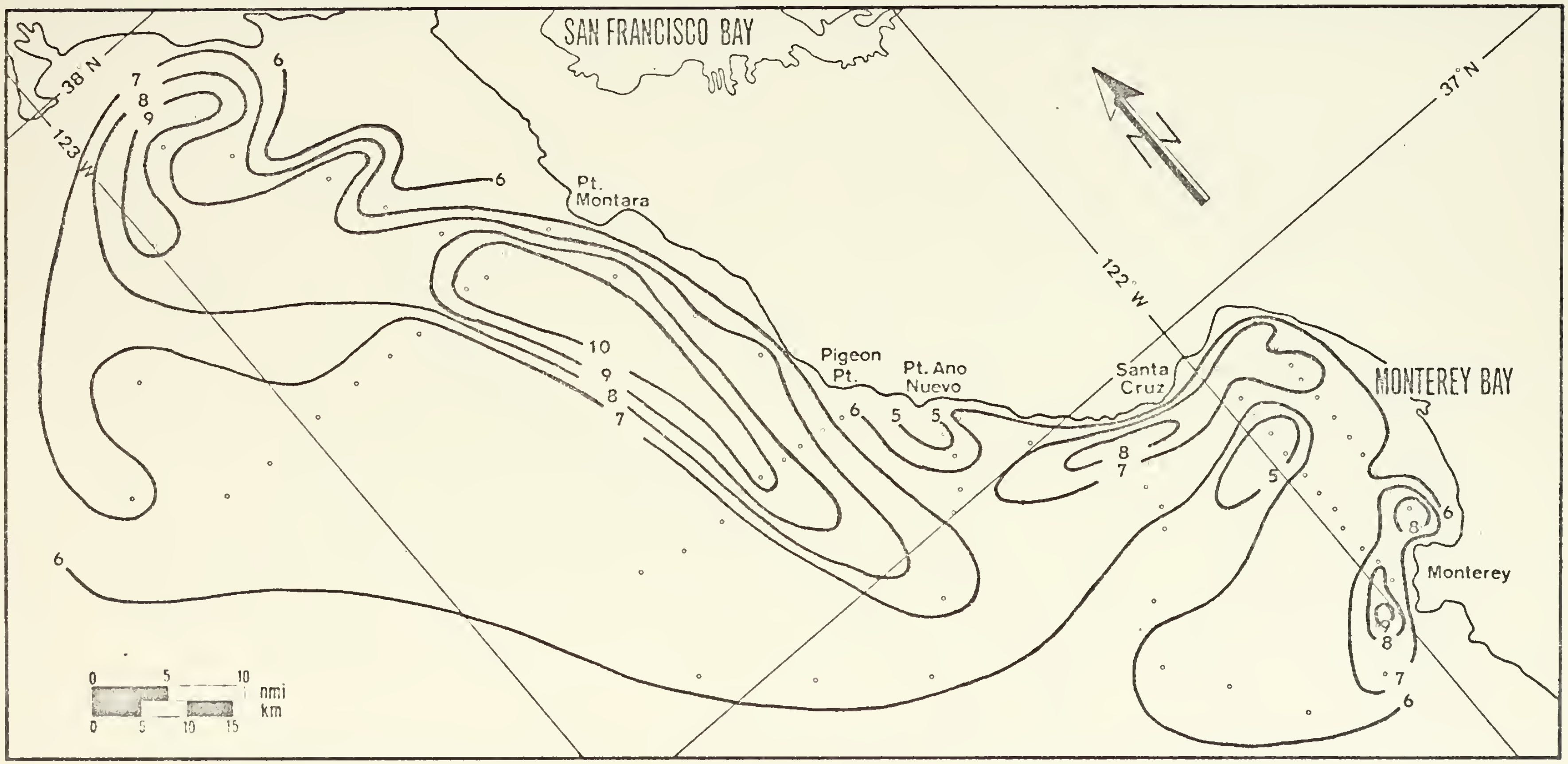


FIGURE 15. Surface Isopleths of Oxygen (ml/l)

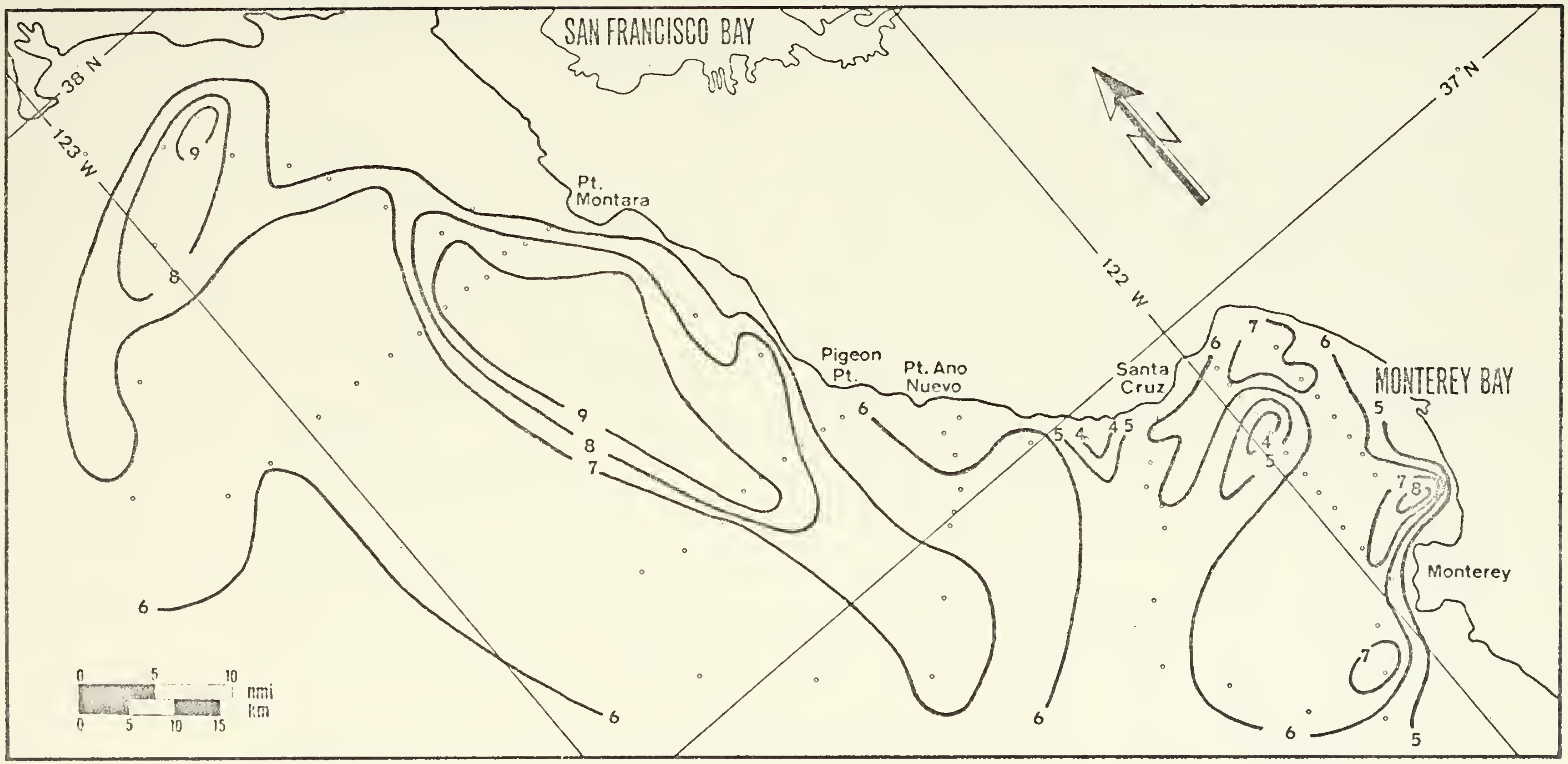


FIGURE 16. 10 m Isopleths of Oxygen (ml/1)

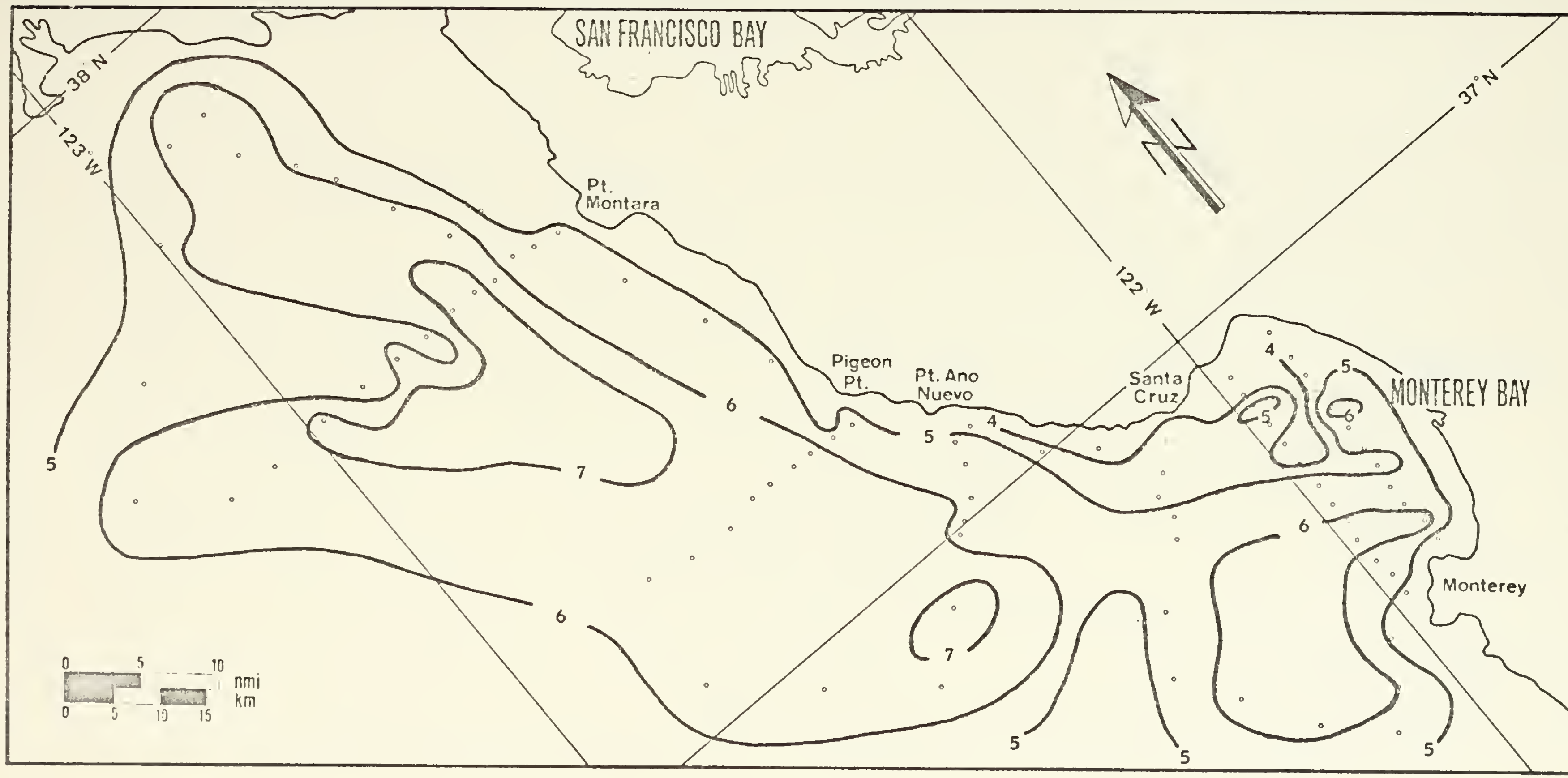


FIGURE 17. 20 m Isopleths of Oxygen (ml/1)

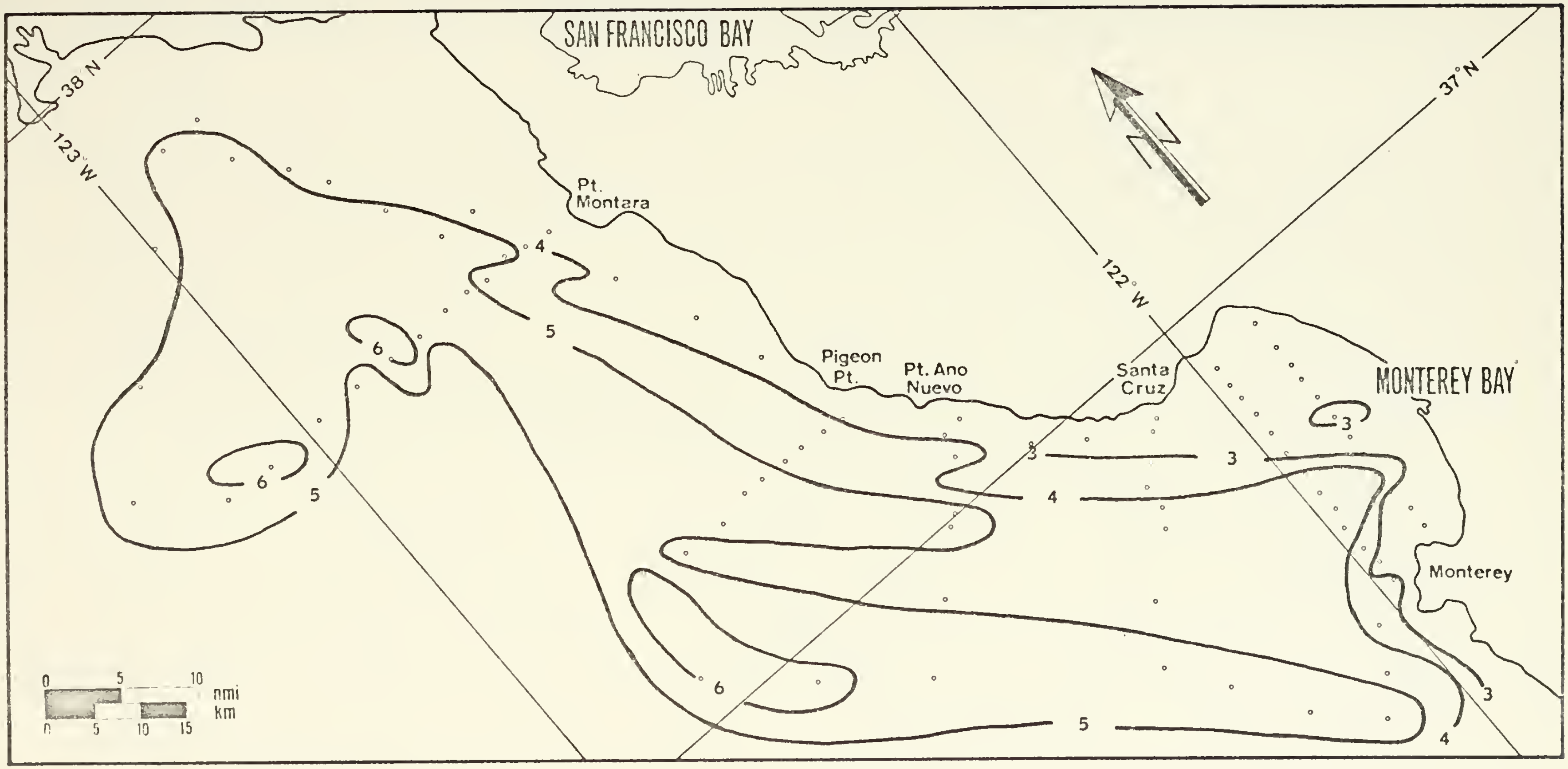


FIGURE 18. 40 m Isopleths of Oxygen (ml/1)

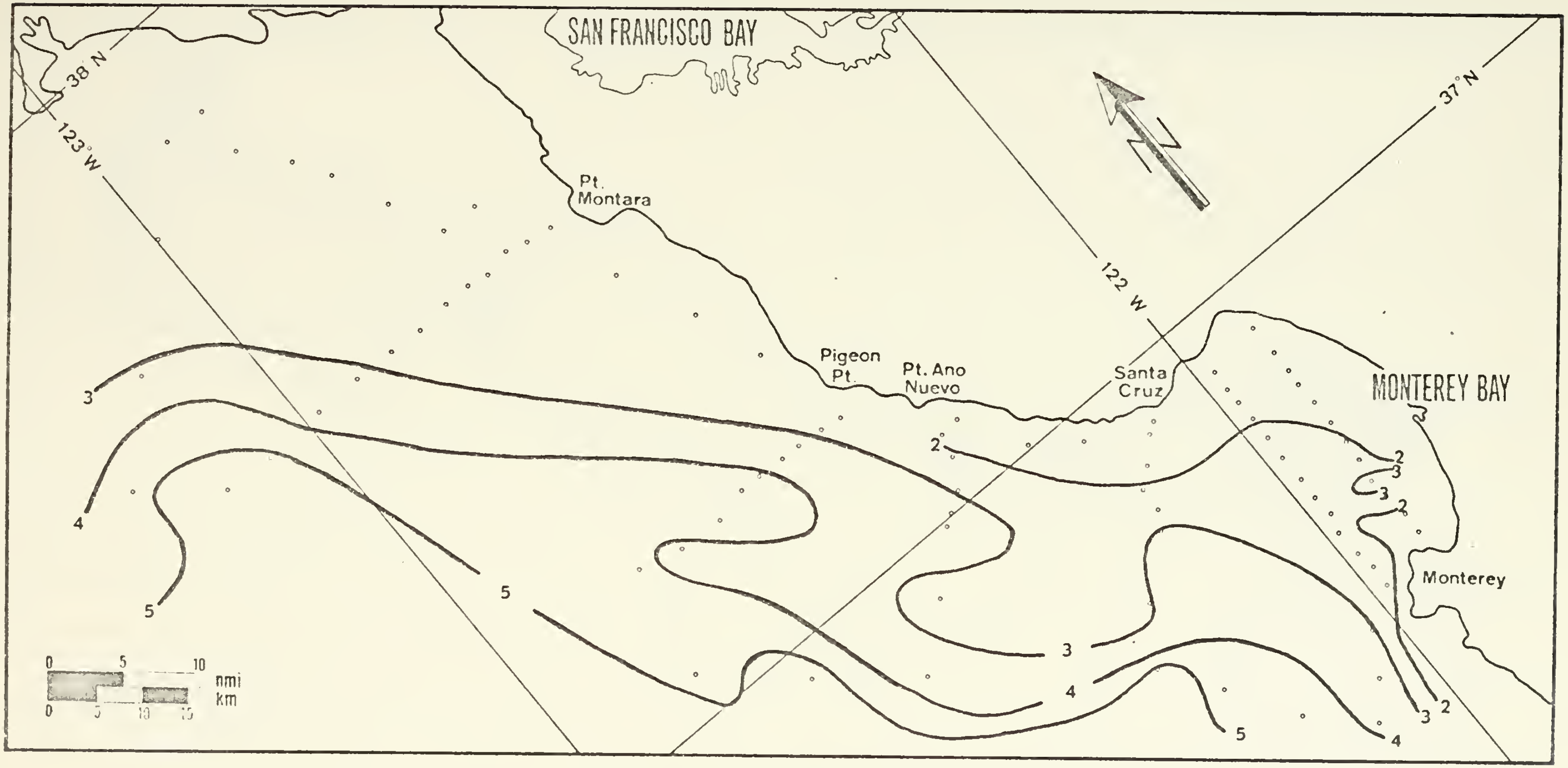


FIGURE 19. 75 m Isopleths of Oxygen (ml/l)

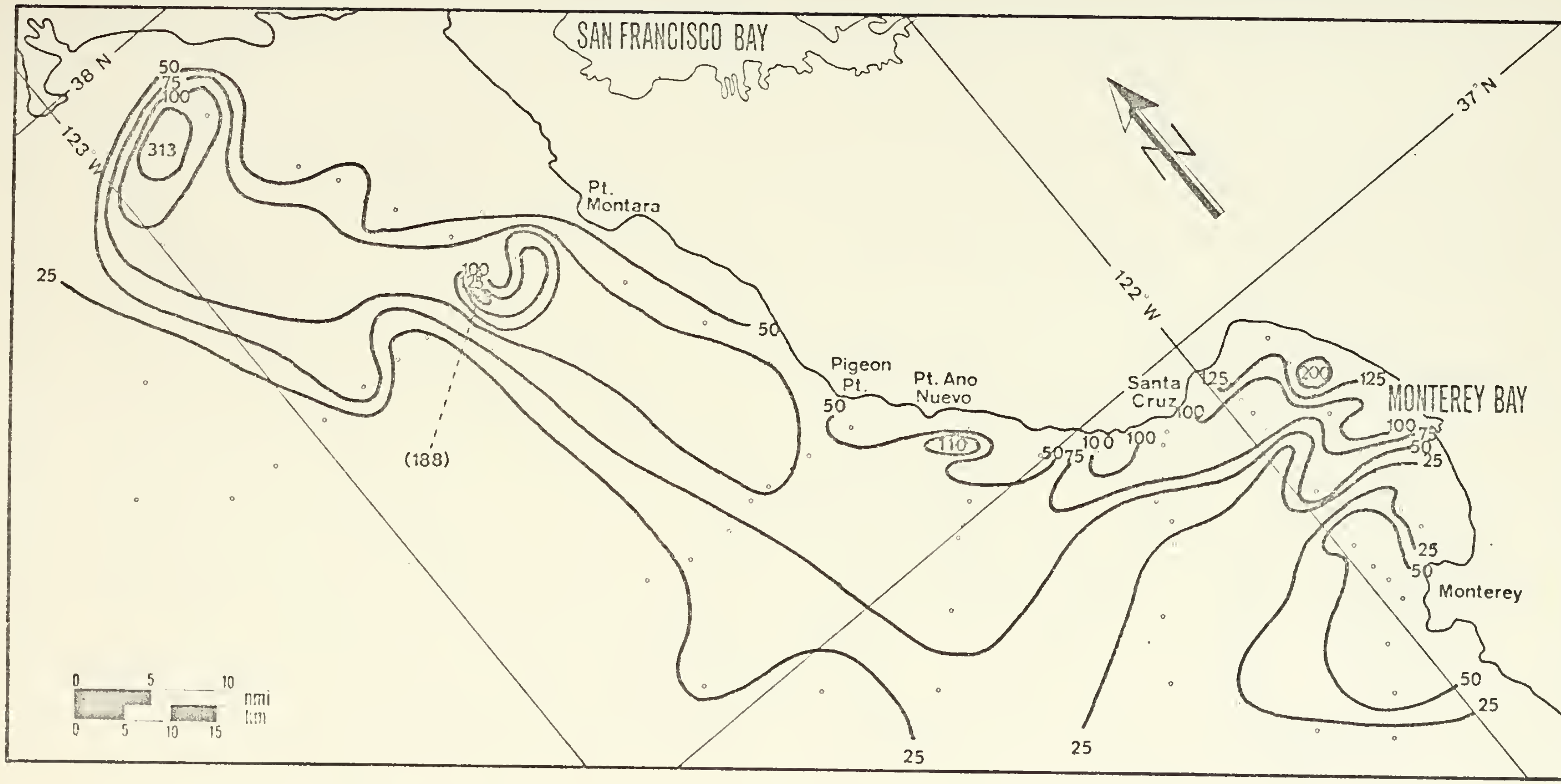


FIGURE 20. Surface Isopleths of Total Coulter Count (x 10^{-3})

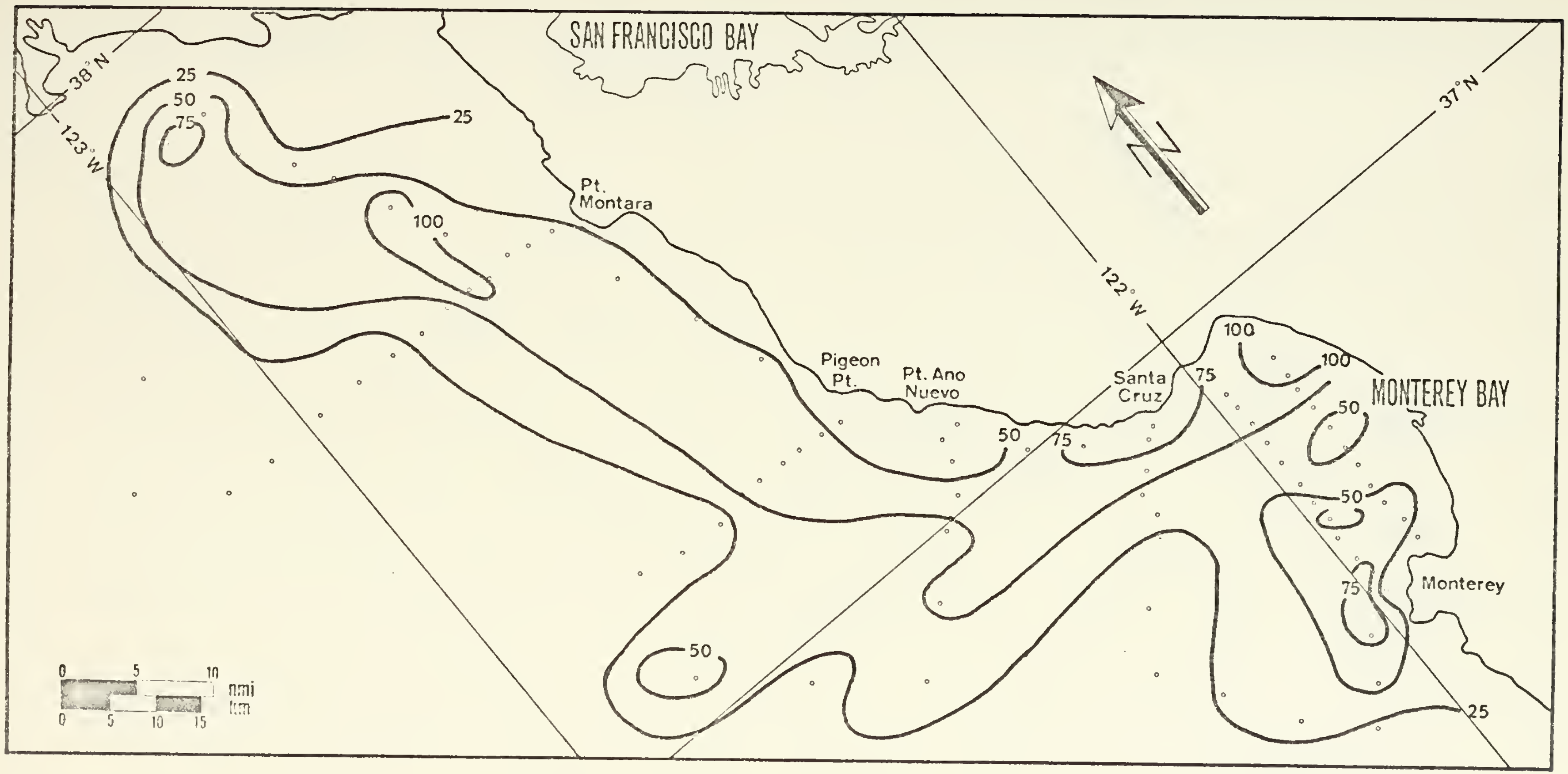


FIGURE 21. 10 m Isopleths of Total Coulter Count (x 10^{-3})

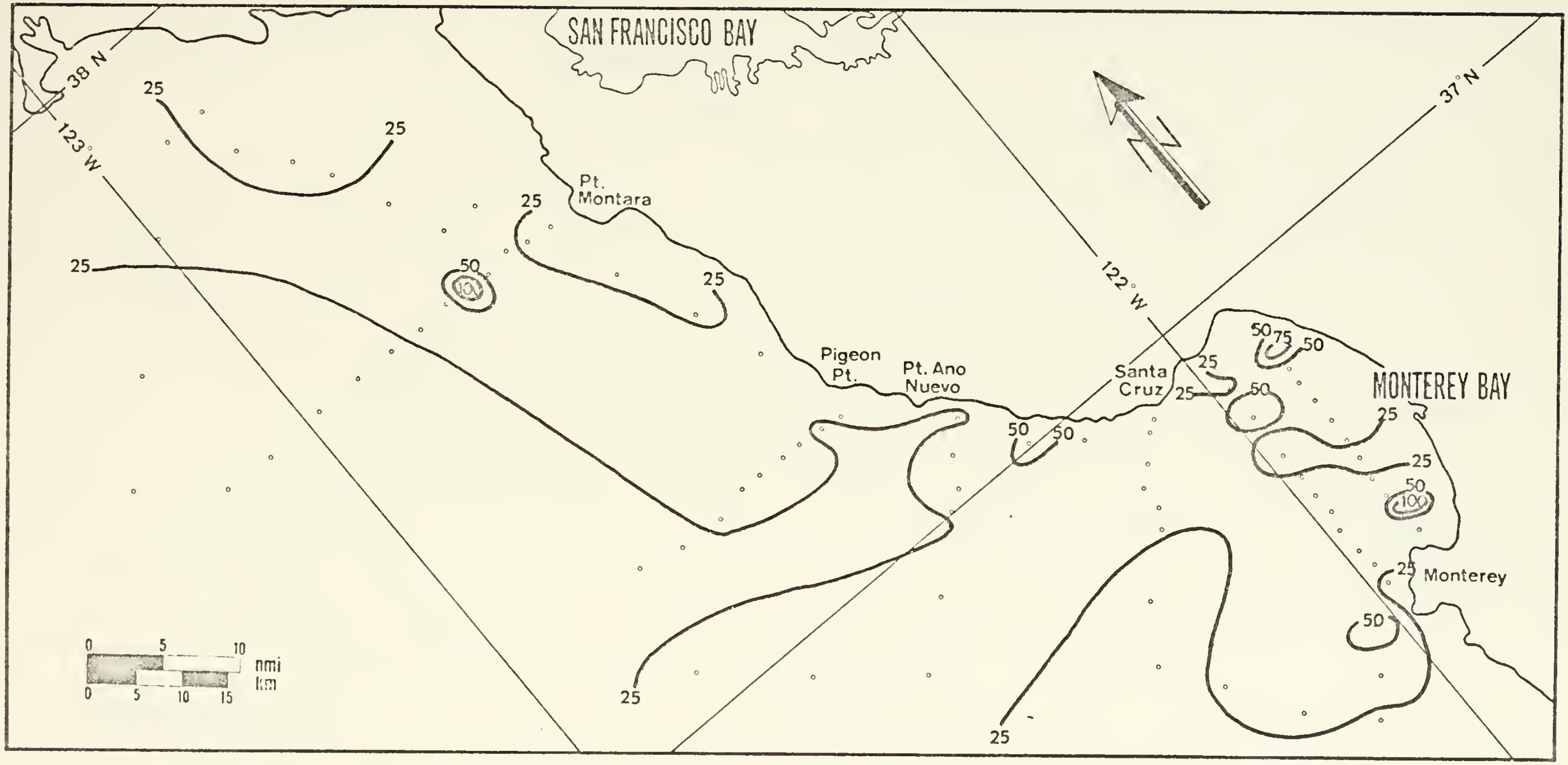


FIGURE 22. Isopleths of Total Coulter Count (x 10^{-3})

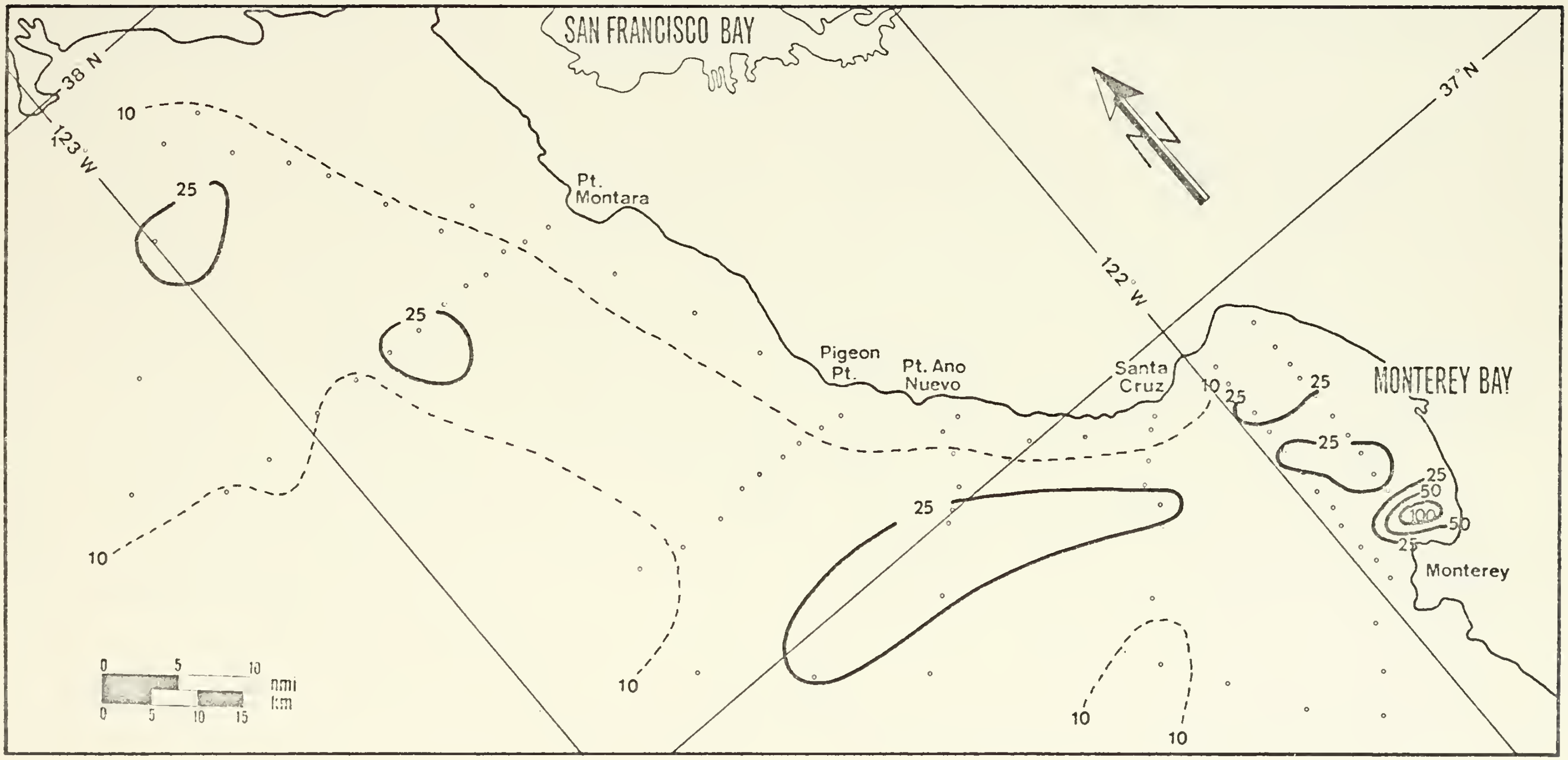


FIGURE 23. Isopleths of Total Coulter Count (x 10^{-3})

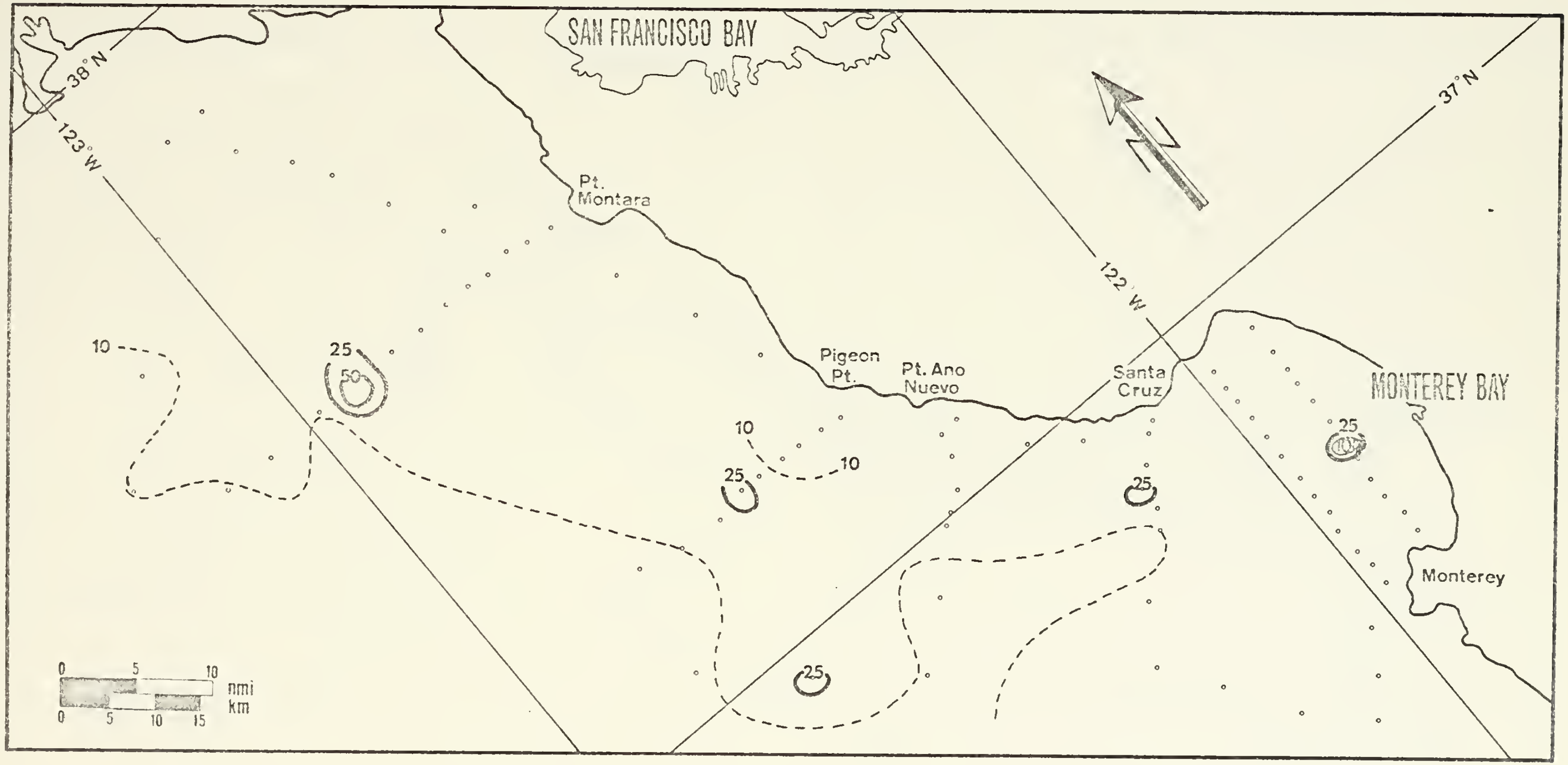


FIGURE 24. 75 m Isopleths of Total Coulter Count (x 10^{-3})

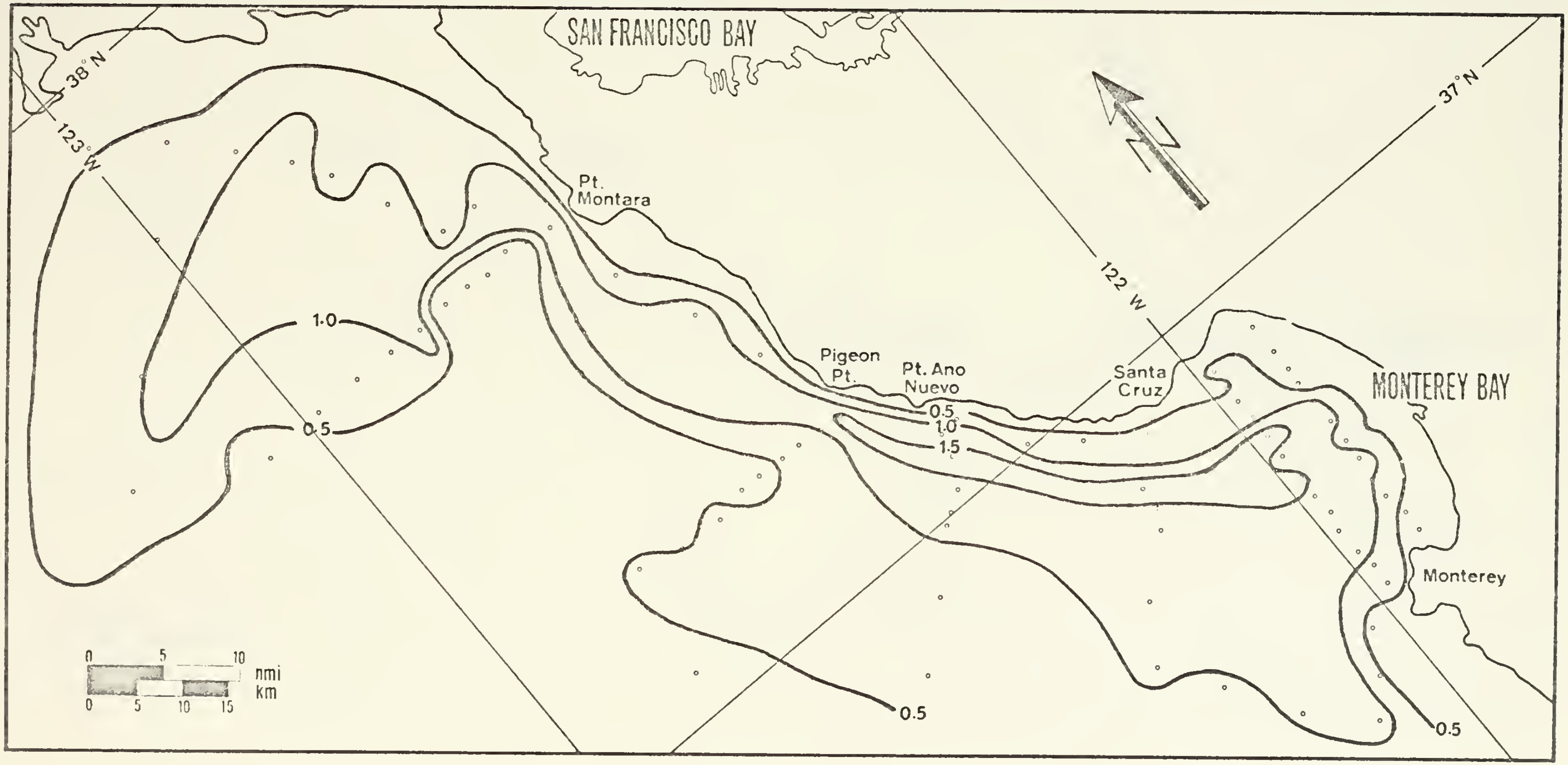


FIGURE 25. Surface Isopleths of Phosphate (μg-at/l)

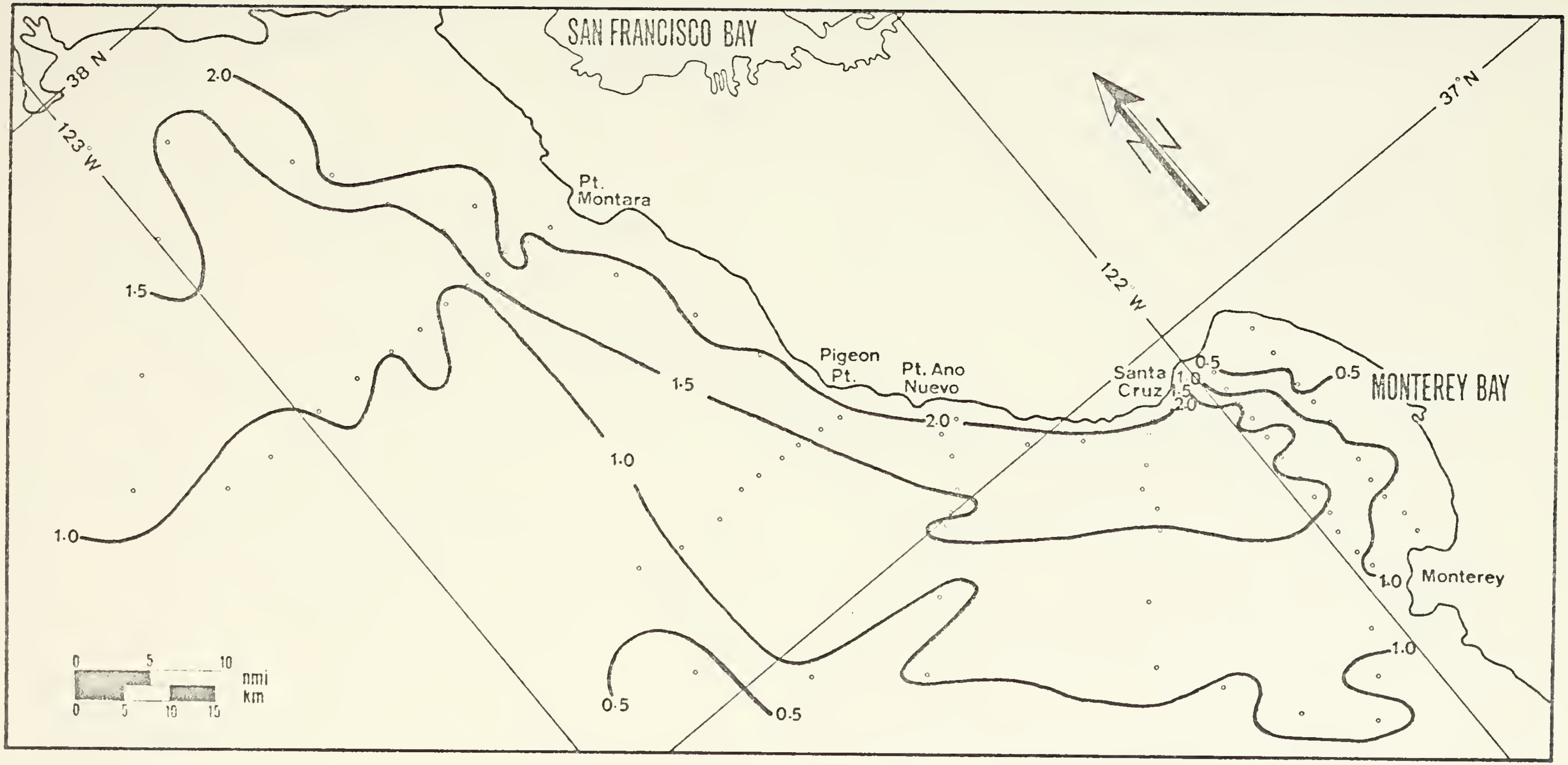


FIGURE 26. 10 m Isopleths of Phosphate (μg-at/l)

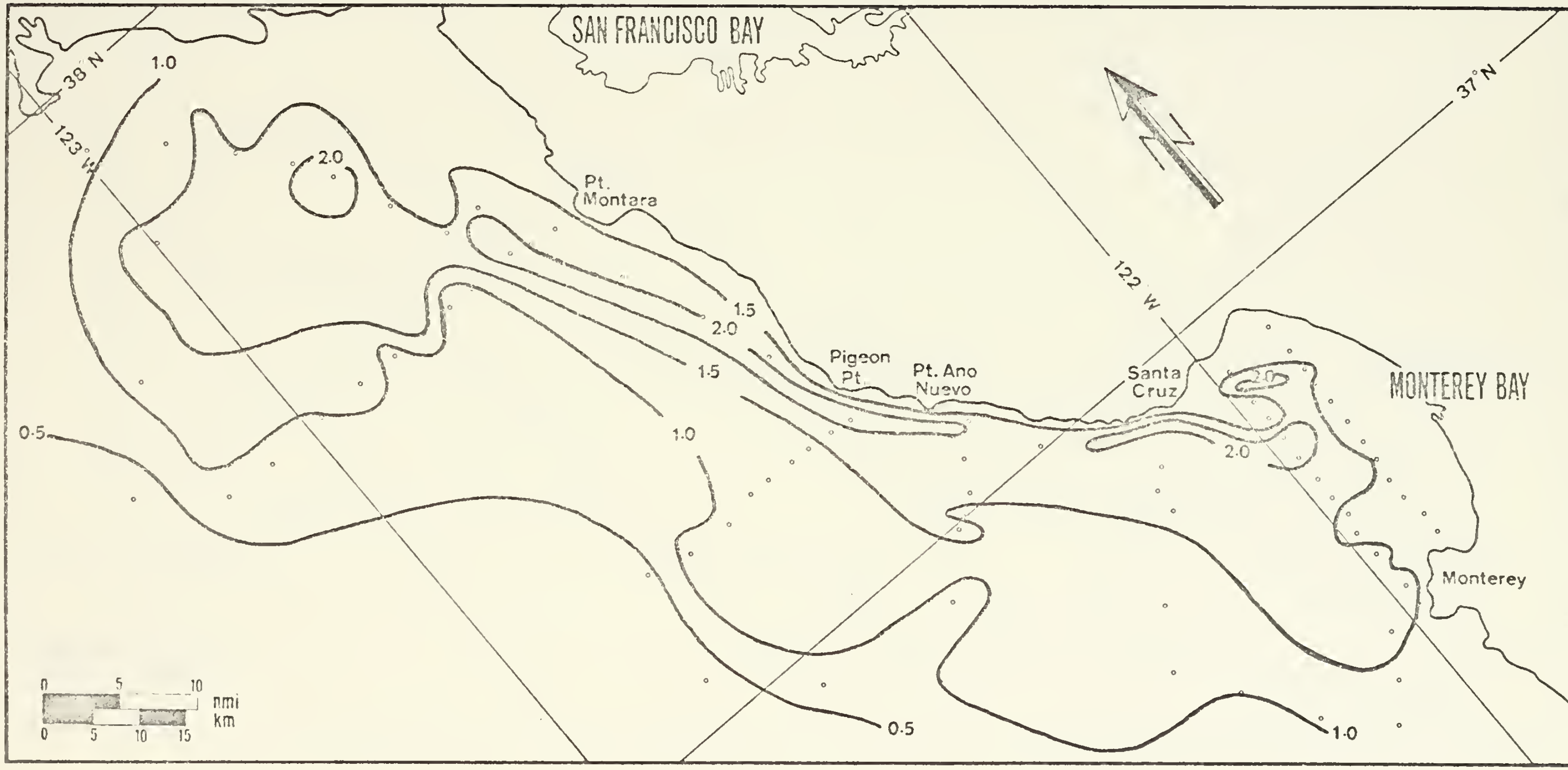


FIGURE 27. 20 m Isopleths of Phosphate (μg-at/1)

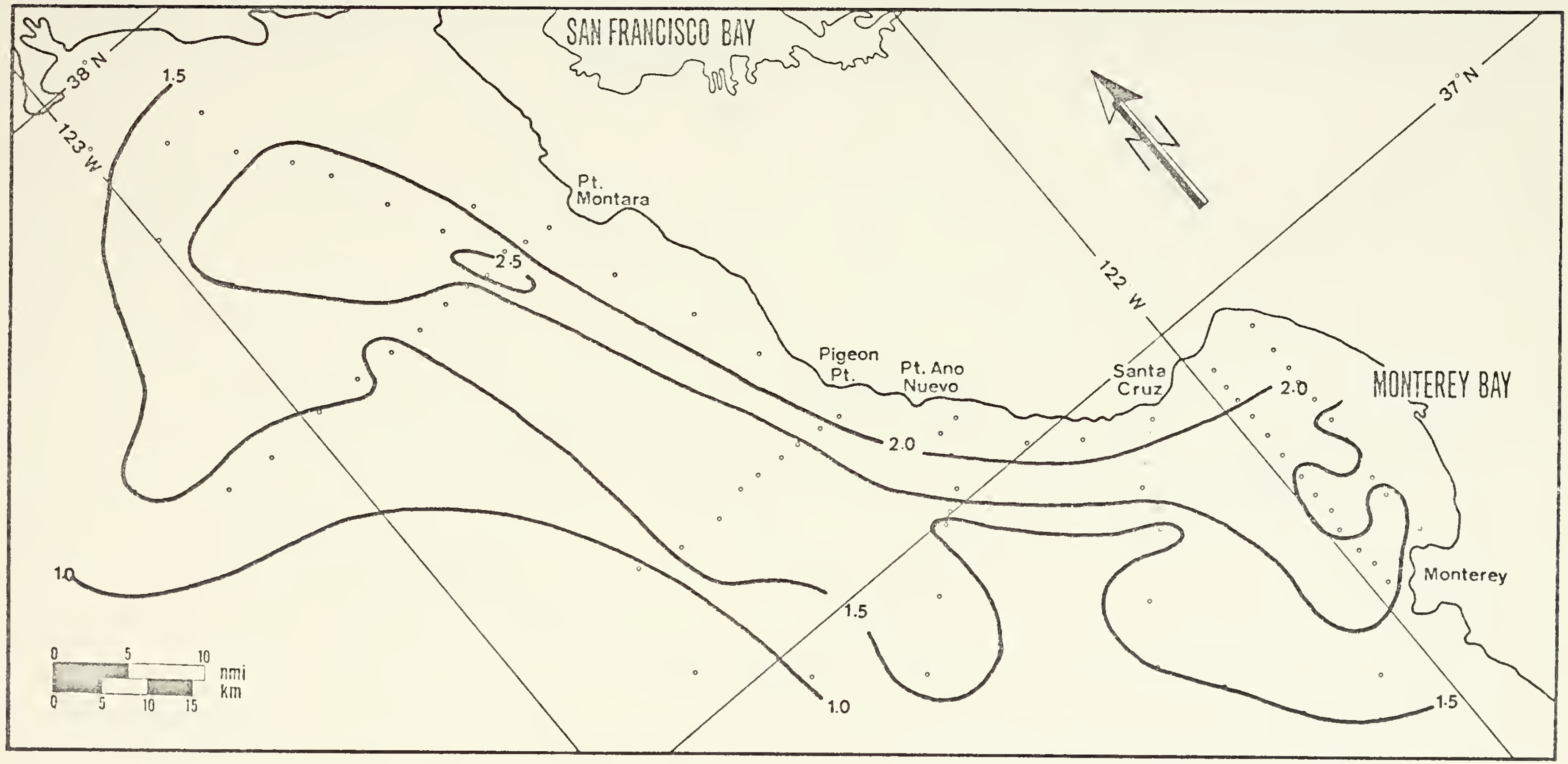


FIGURE 28. 40 m Isopleths of Phosphate (μg-at/l)

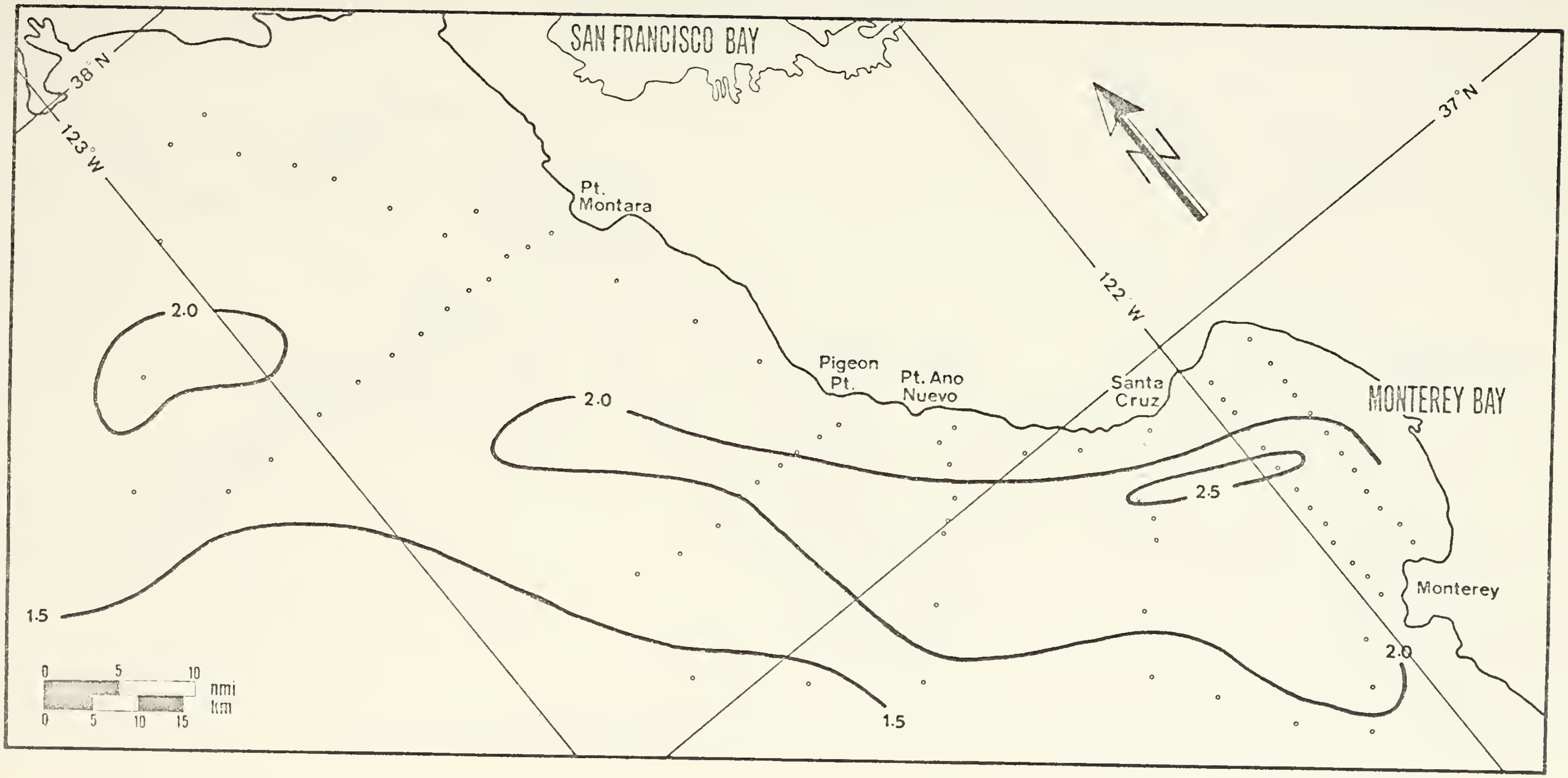


FIGURE 29. 75 m Isopleths of Phosphate (μg-at/l)

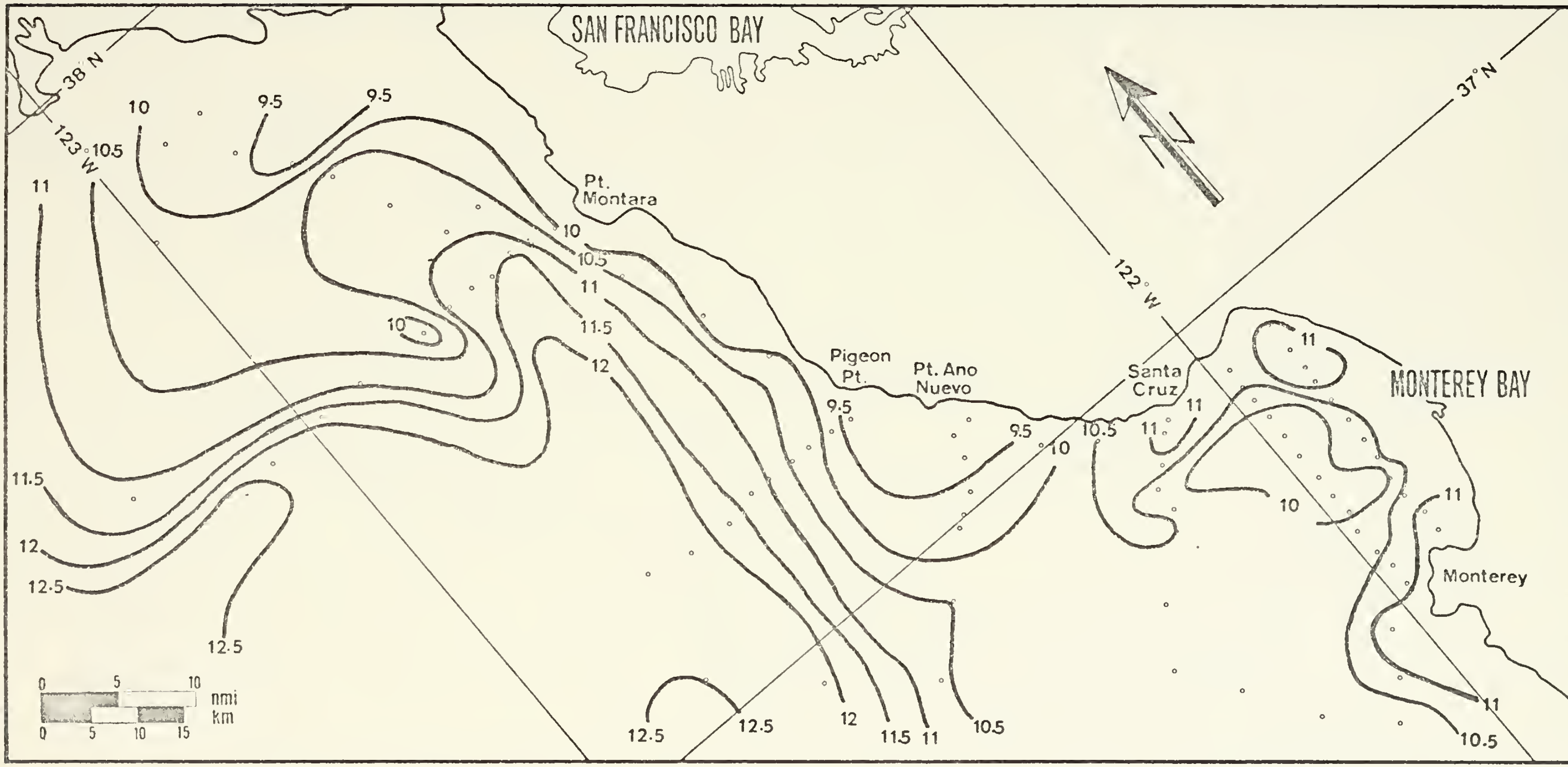


FIGURE 30. Surface Isotherms (°C)

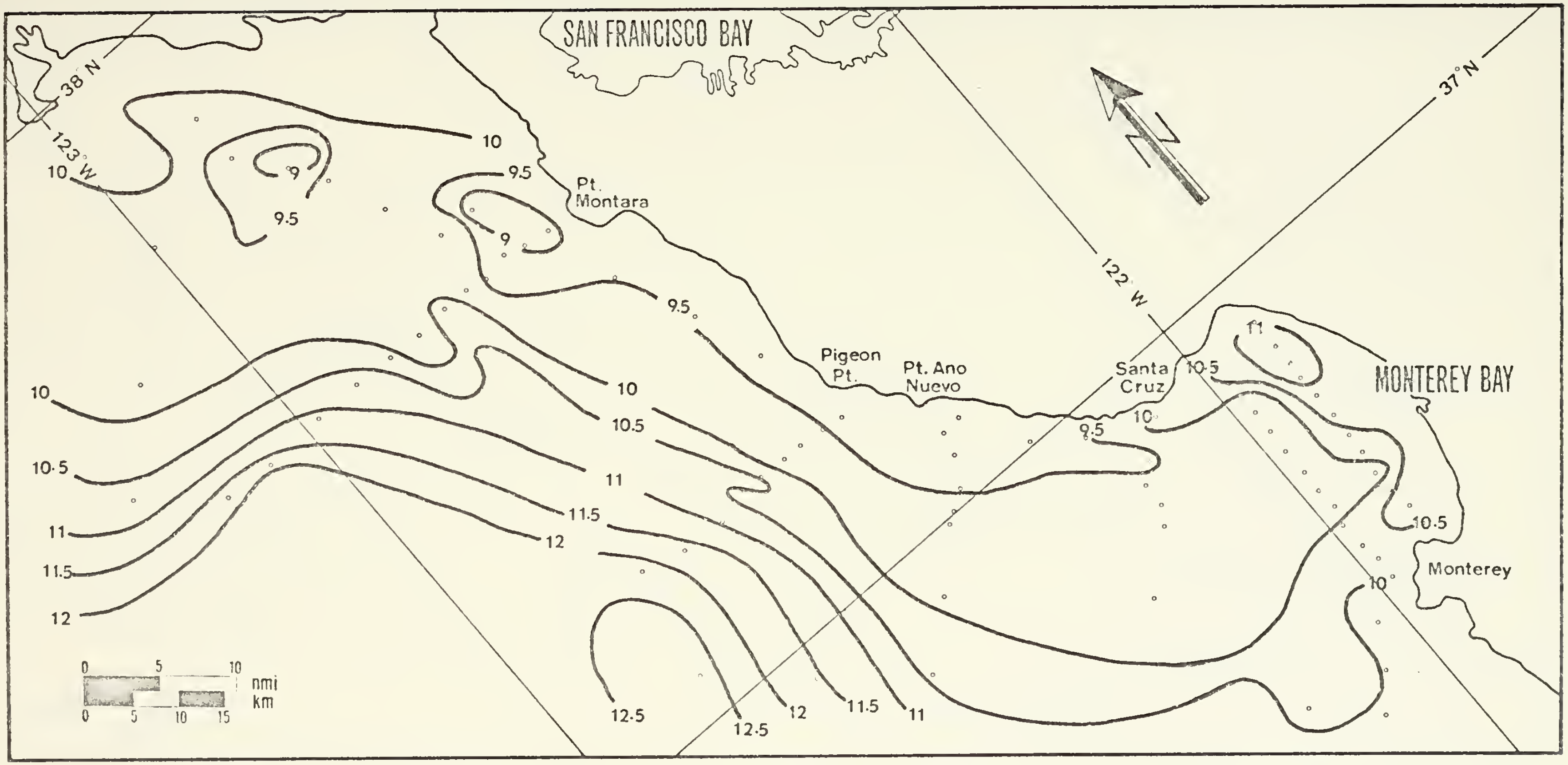


FIGURE 31. 10 m Isotherms (°C)

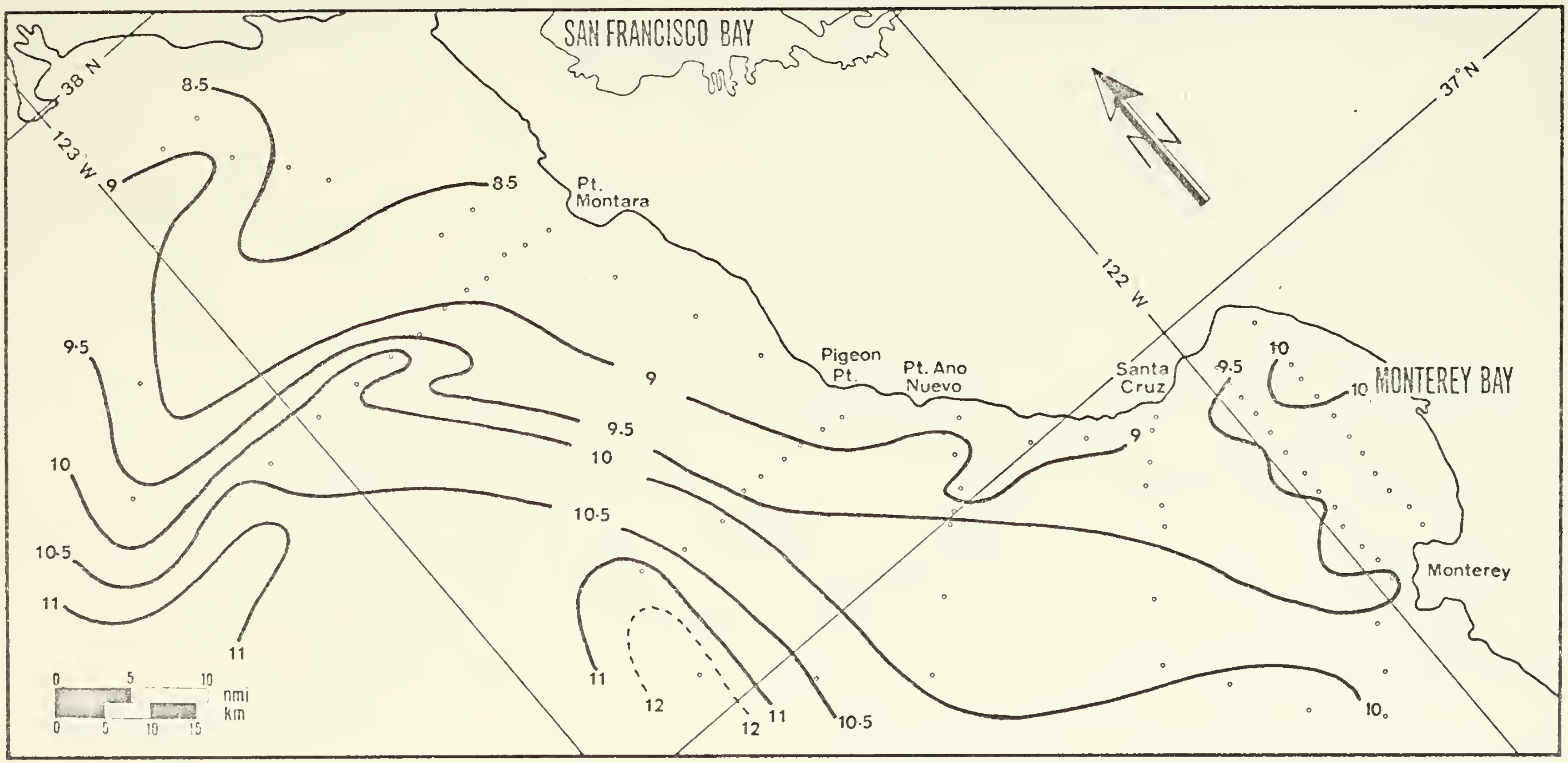


FIGURE 32. 20 m Isotherms (^{O}C)

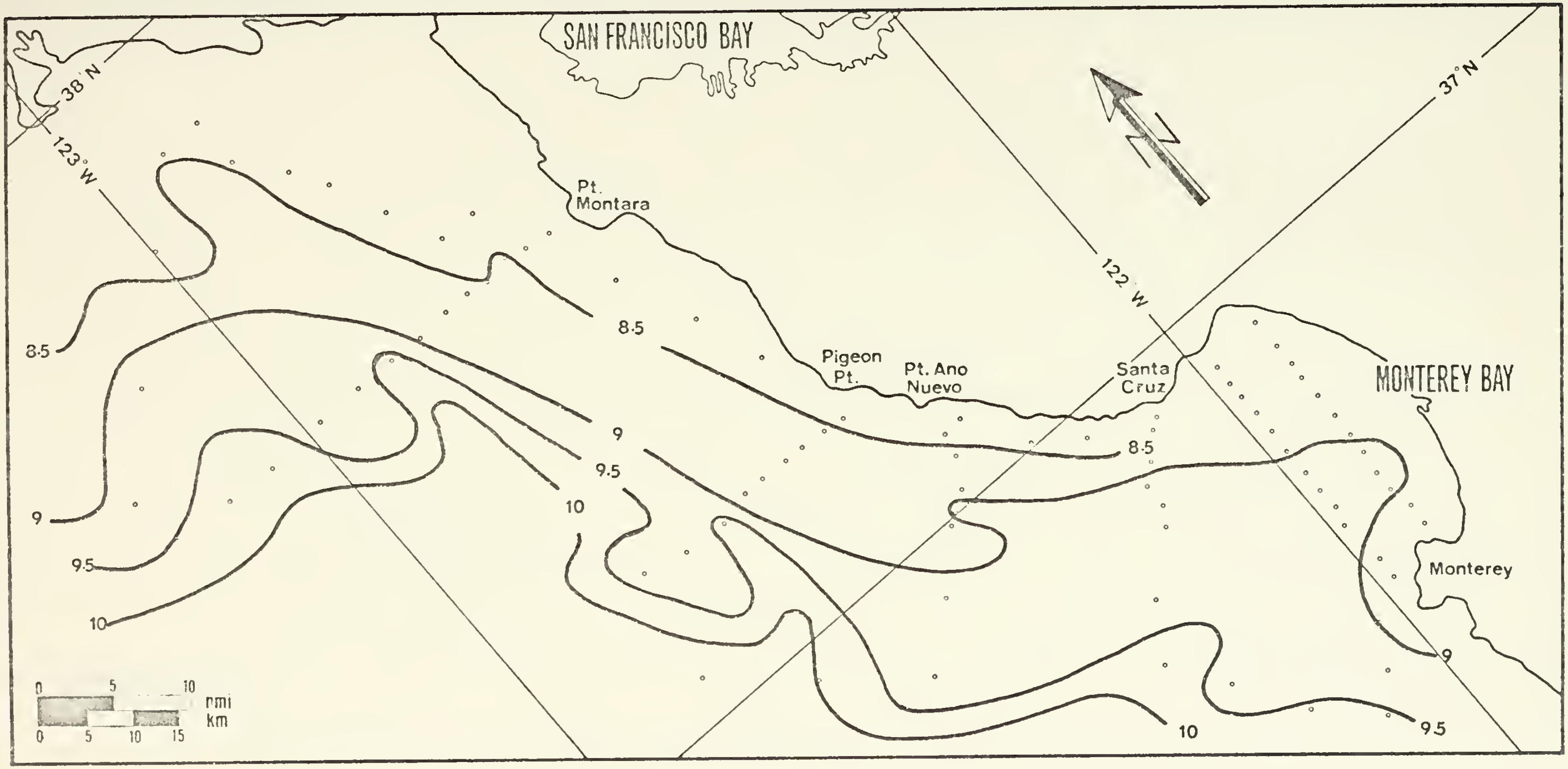


FIGURE 33. 40 m Isotherms (°C)

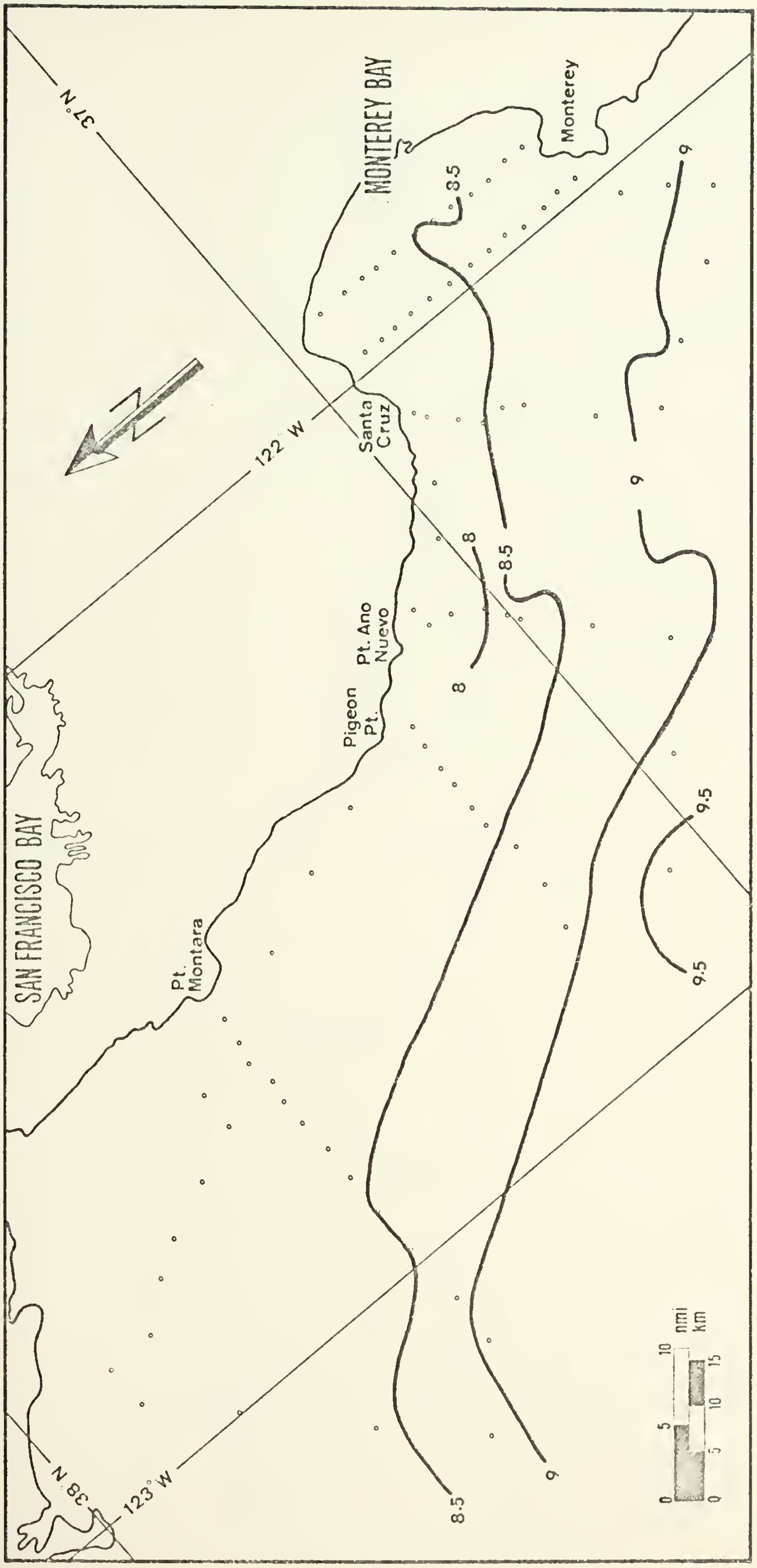


FIGURE 34. 75 m Isotherms (^{o}C)

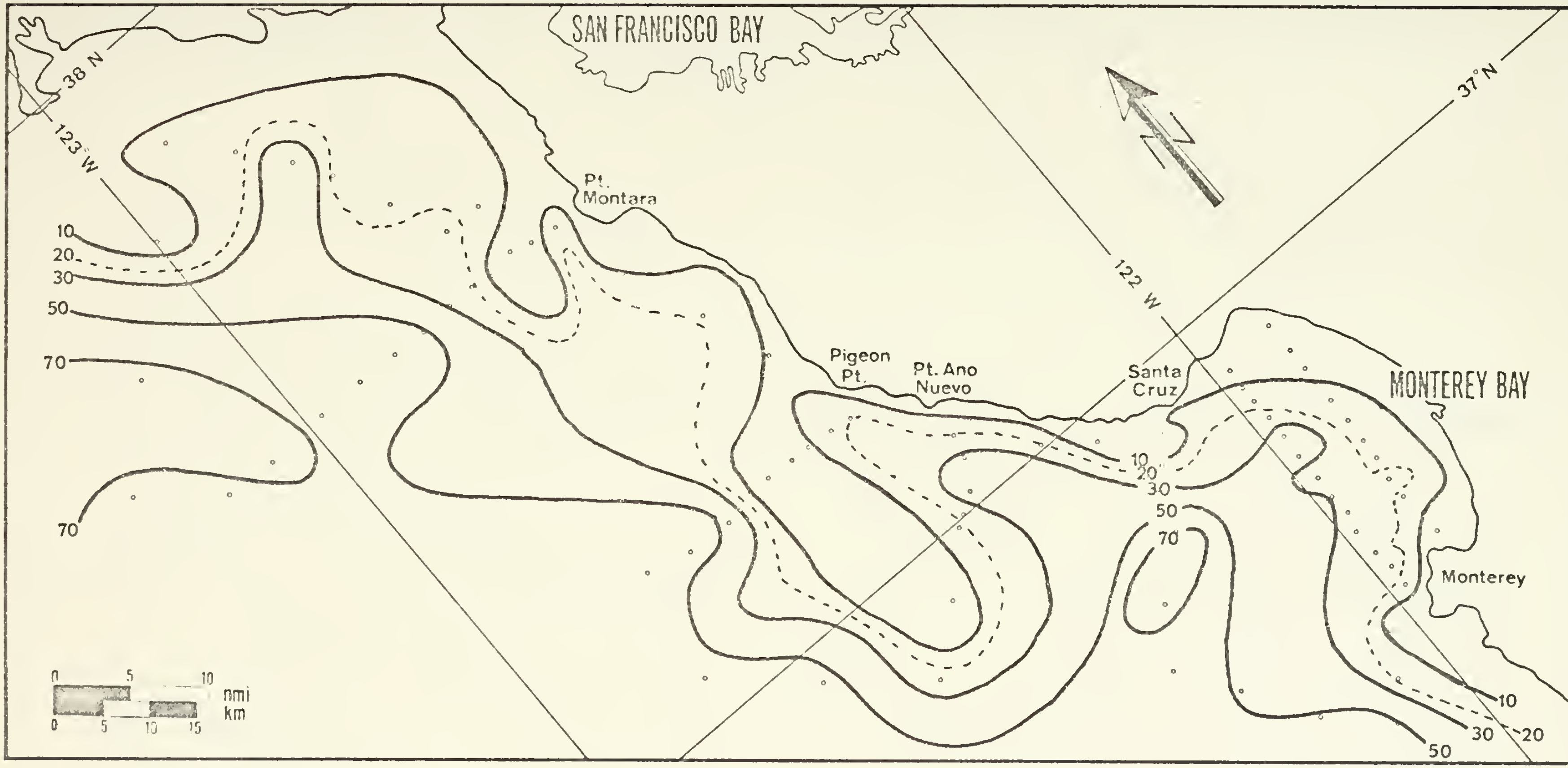


FIGURE 35. Surface Isopleths of Beam Transmittance (%/m)

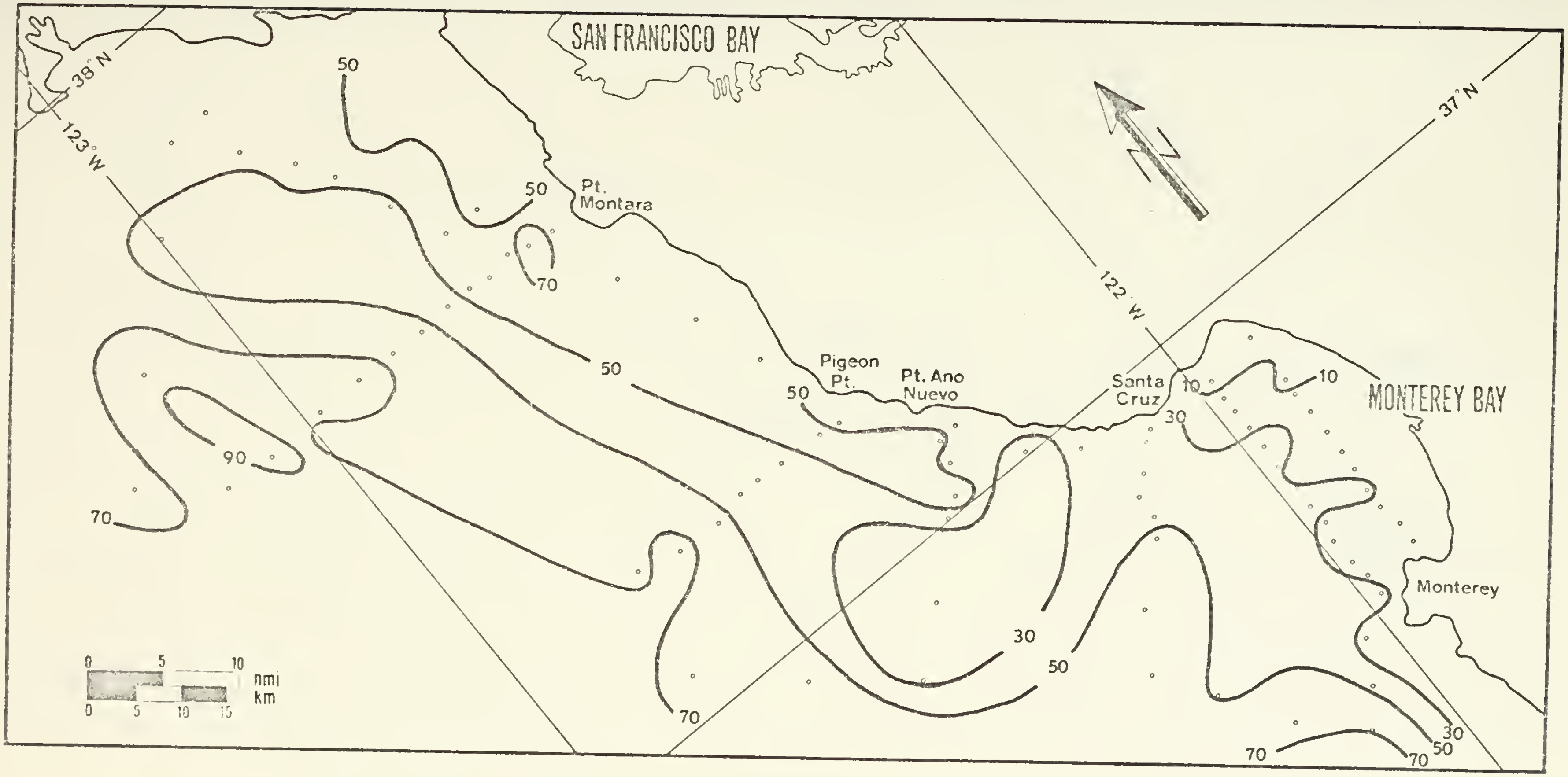


FIGURE 36. 10 m Isopleths of Beam Transmittance (%/m)

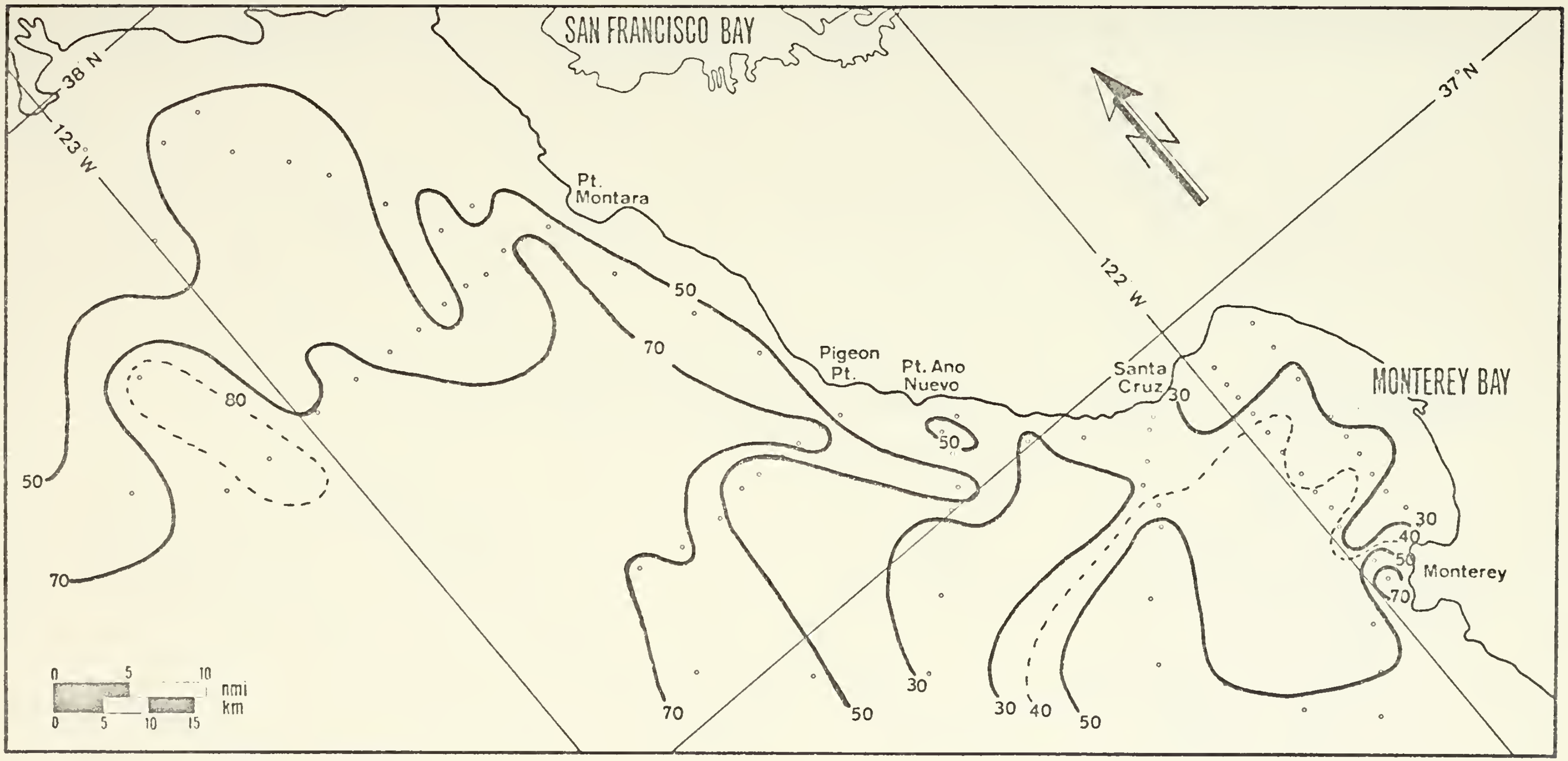


FIGURE 37. 20 m Isopleths of Beam Transmittance (%/m)

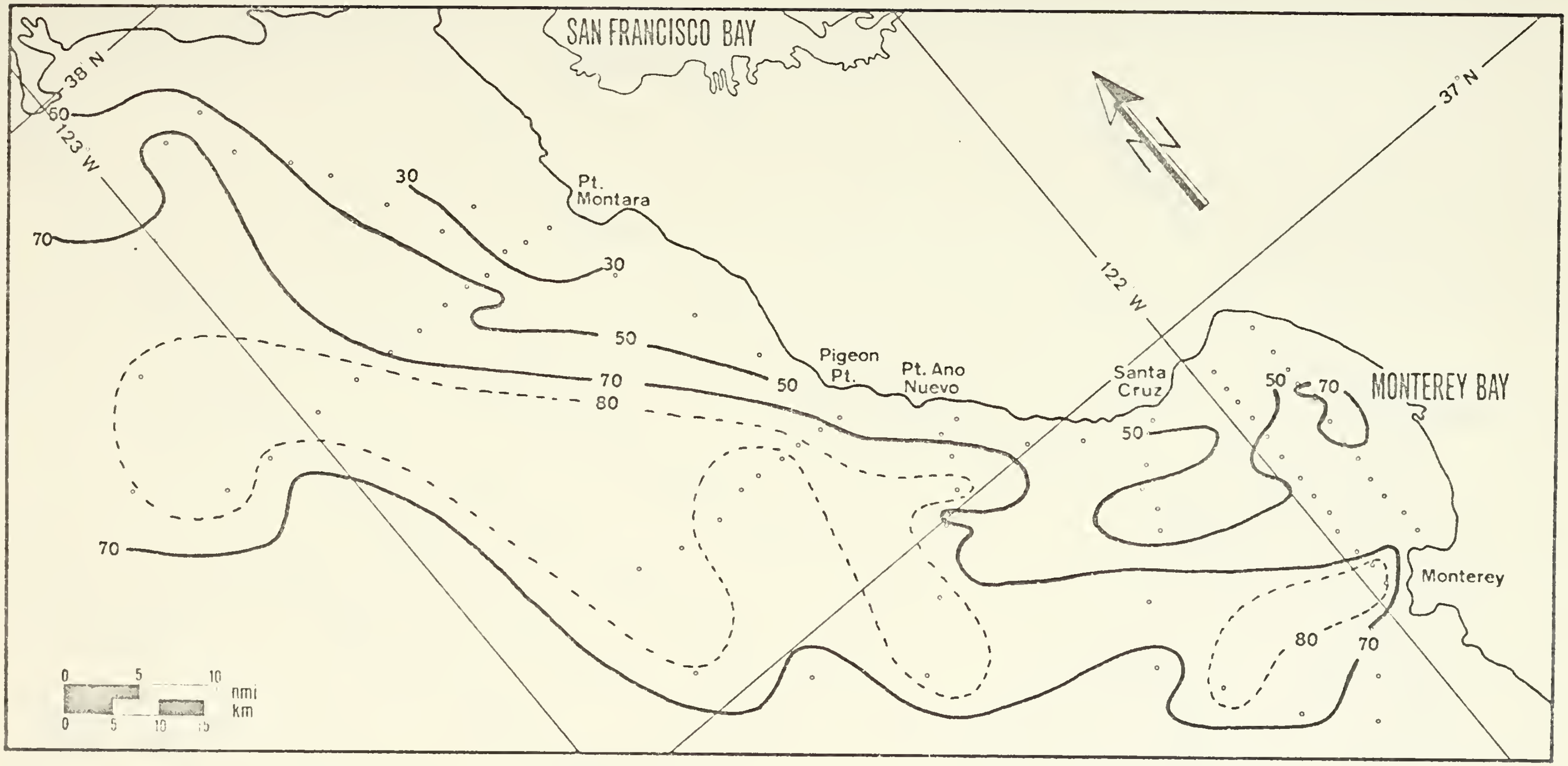


FIGURE 38. 40 m Isopleths of Beam Transmittance (%/m)

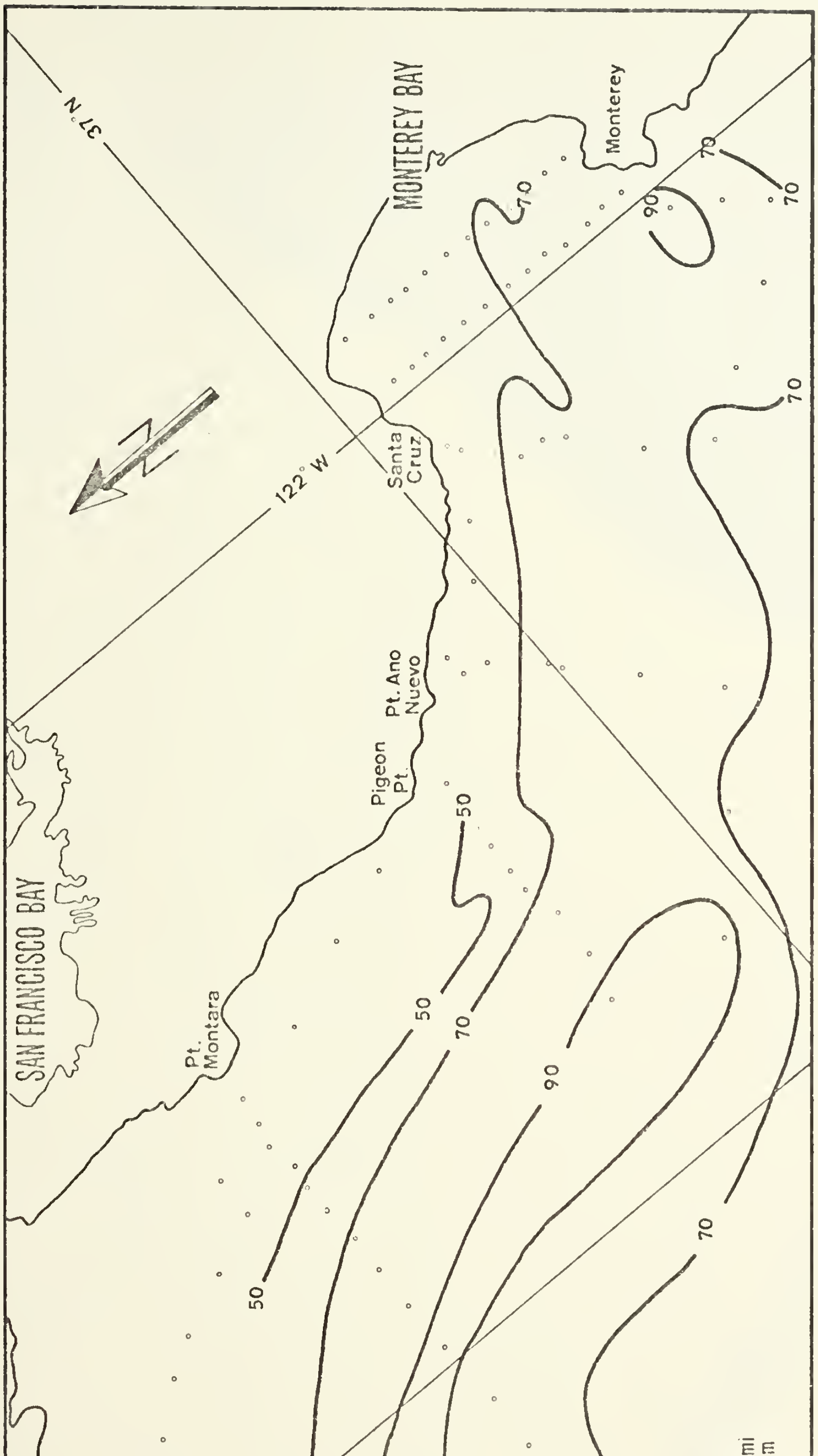


FIGURE 39. 75 m Isopleths of Beam Transmittance (%/m)

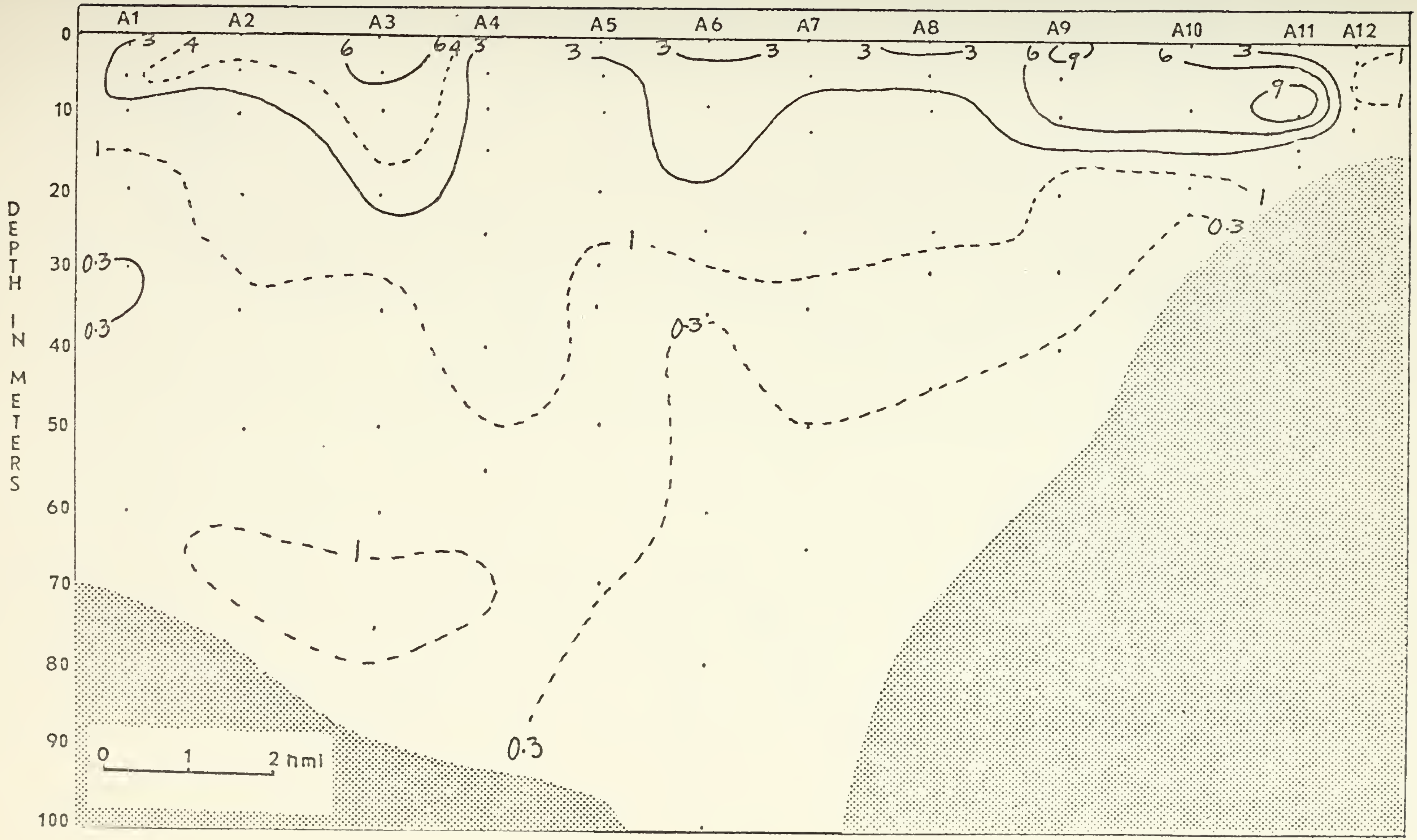


FIGURE 40. Profile of Chlorophyll a (mg/m^3)

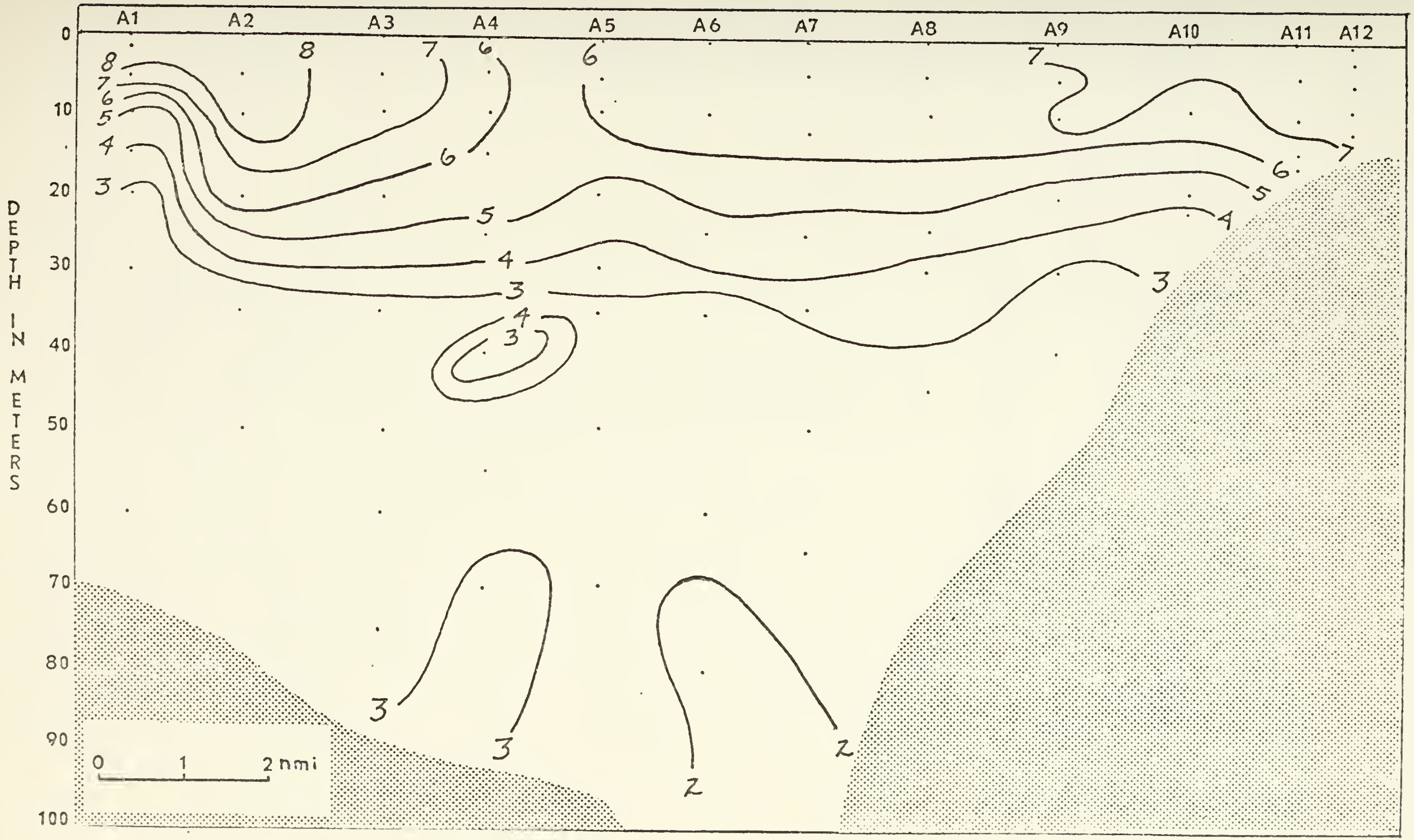


FIGURE 41. Profile of Oxygen (ml/1)

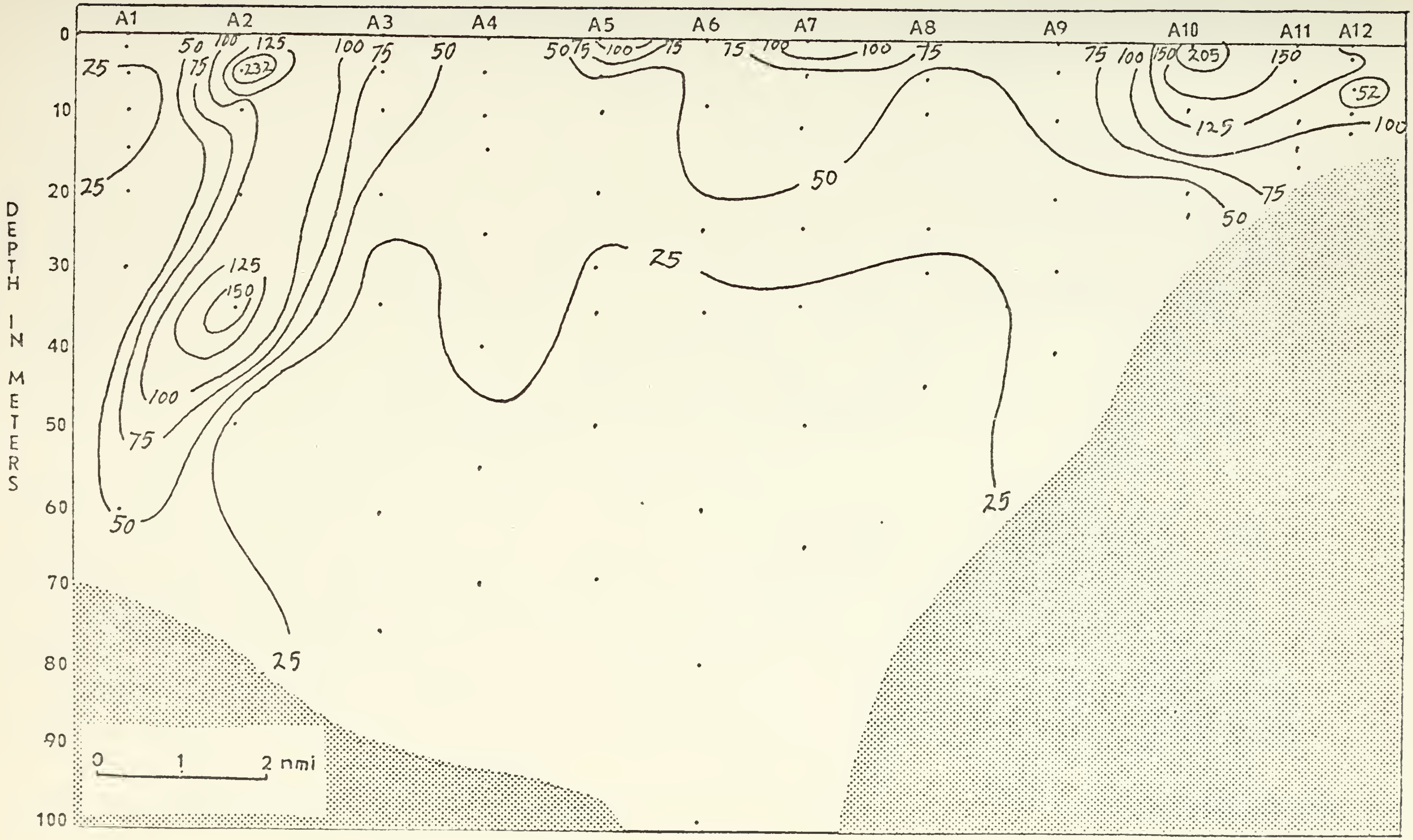


FIGURE 42. Profile of Total Coulter Count (x 10^{-3})

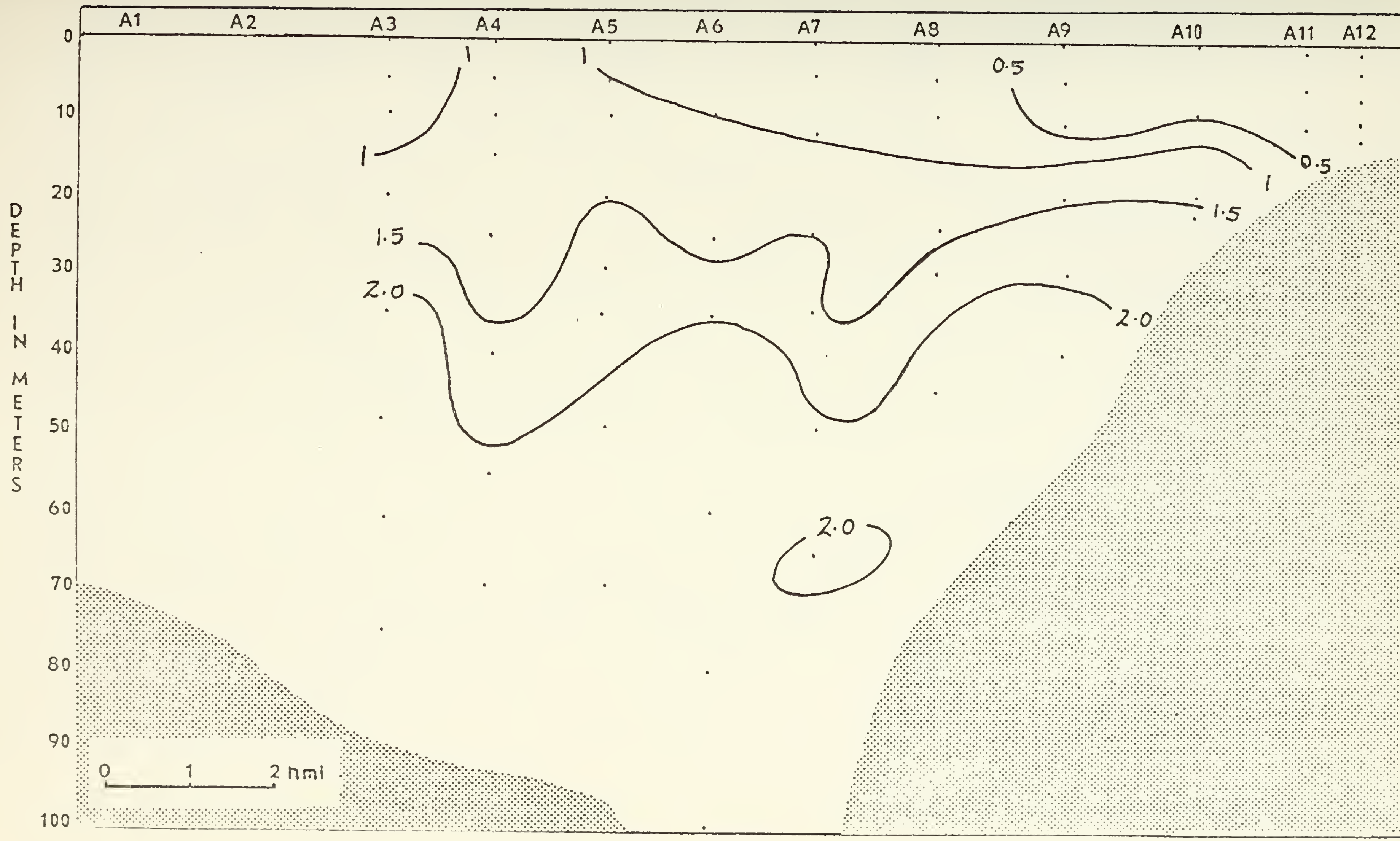


FIGURE 43. Profile of Phosphate (μg-at/l)

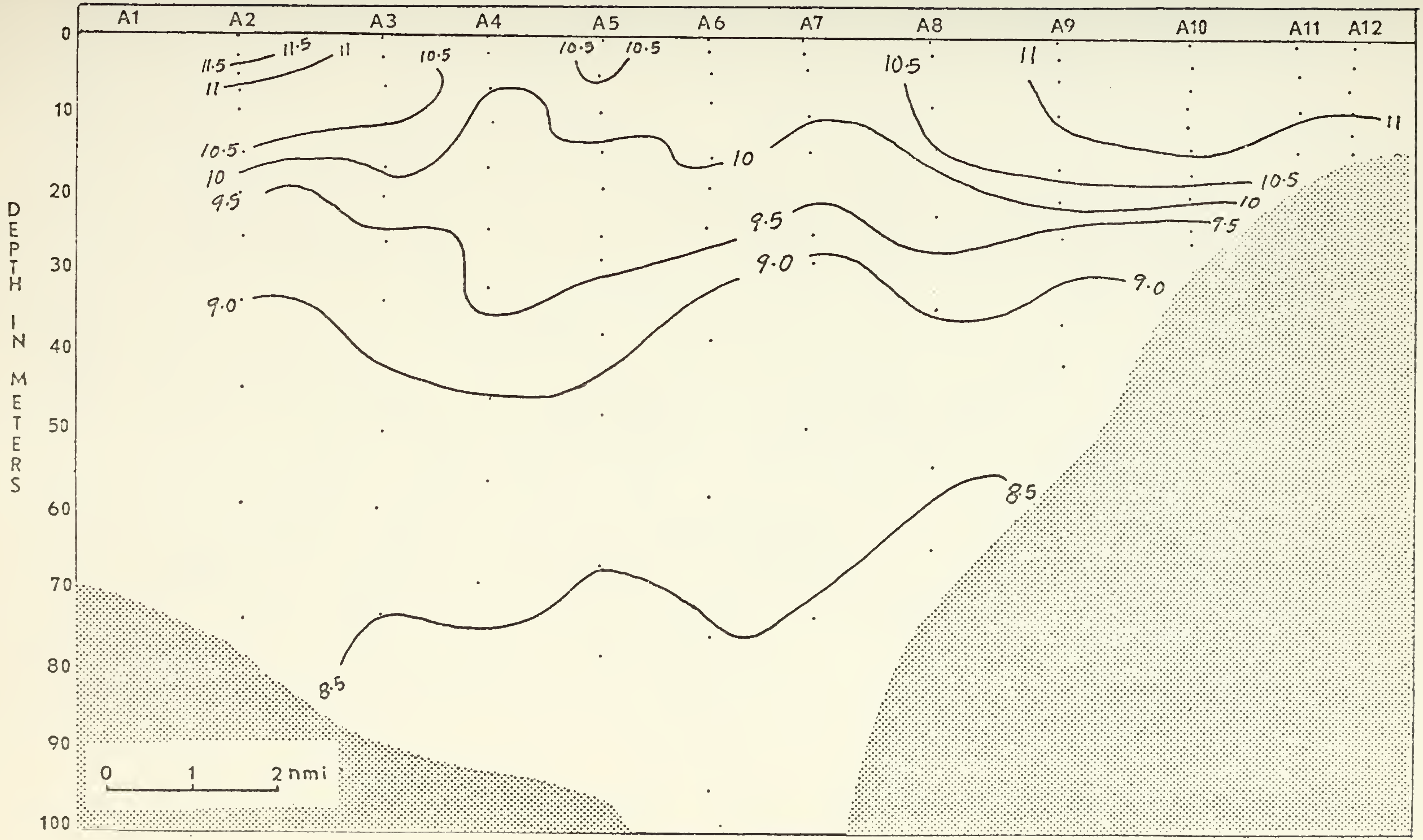


FIGURE 44. Profile of Temperature (°C)

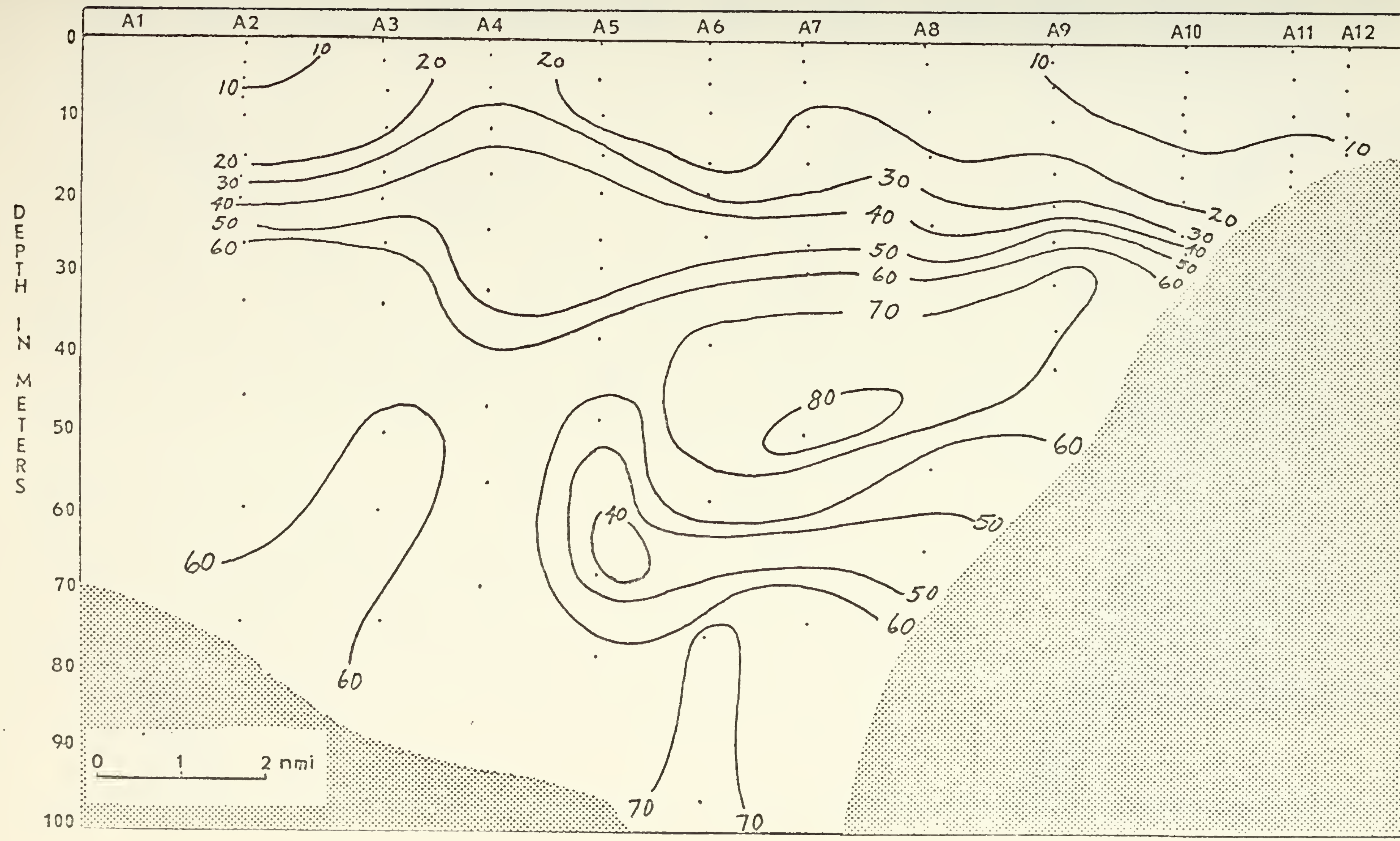


FIGURE 45. Profile of Beam Transmittance (%/m)

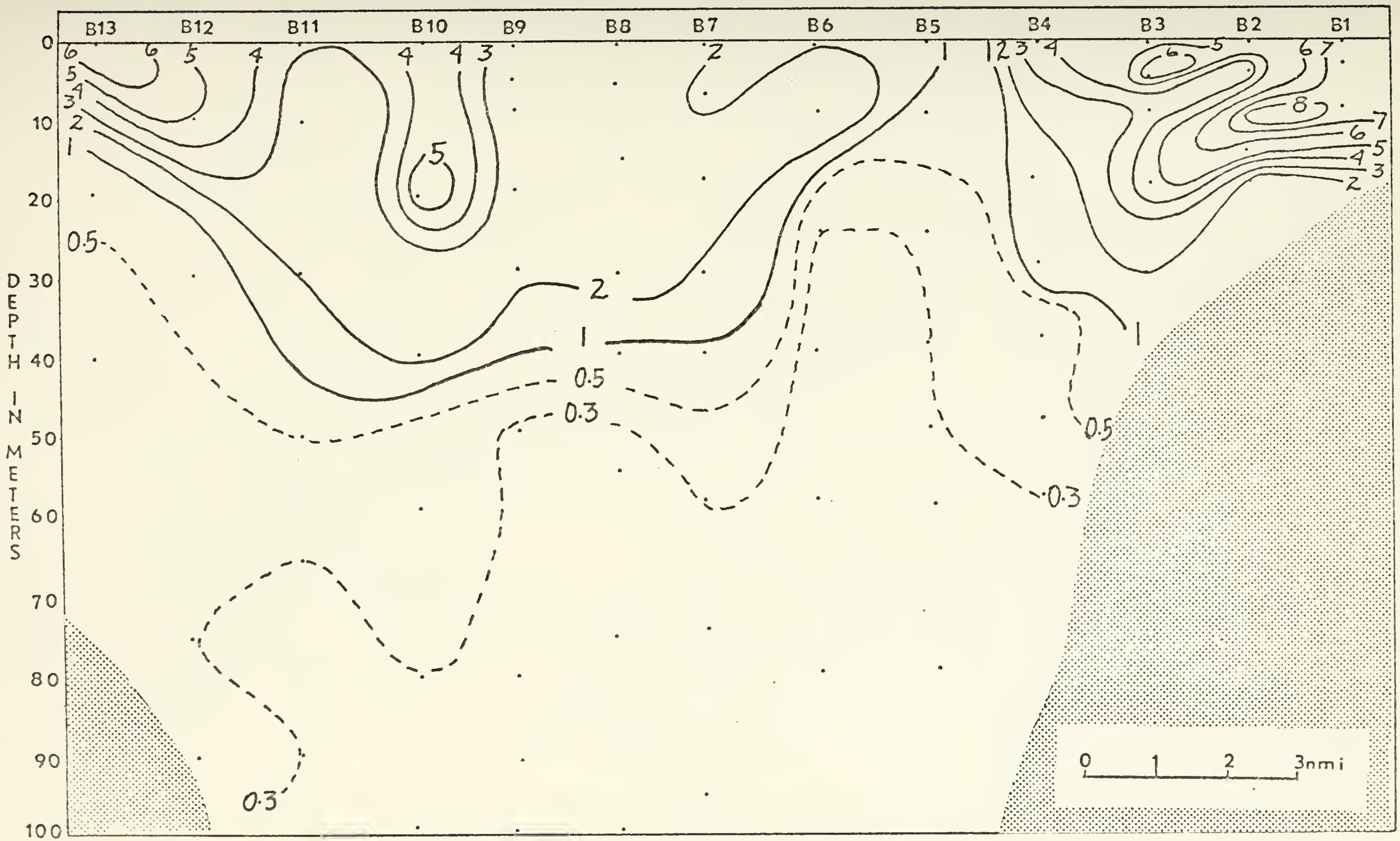


FIGURE 46. Profile of Chlorophyll a (mg/m^3)

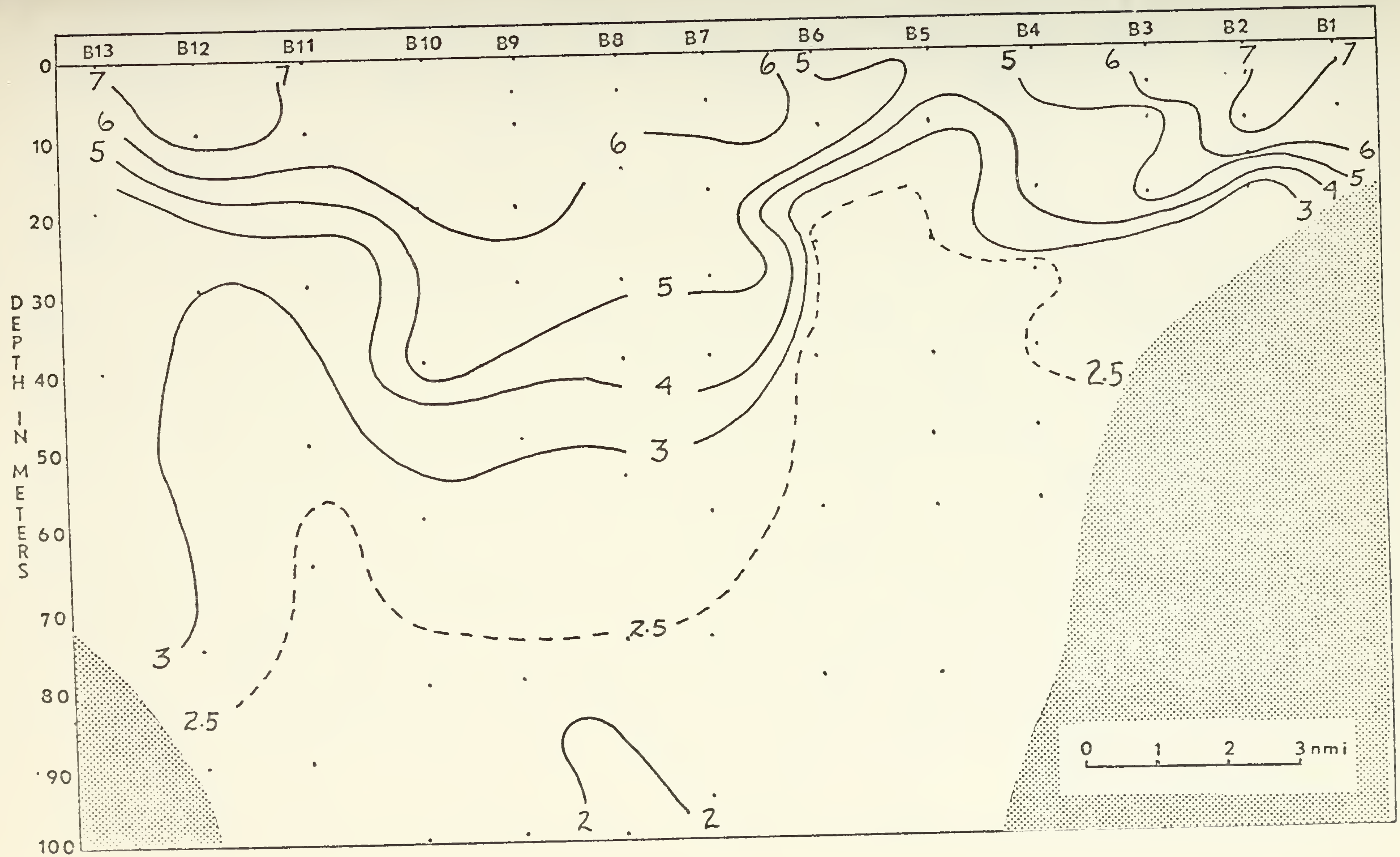


FIGURE 47. Profile of Oxygen (ml/1)

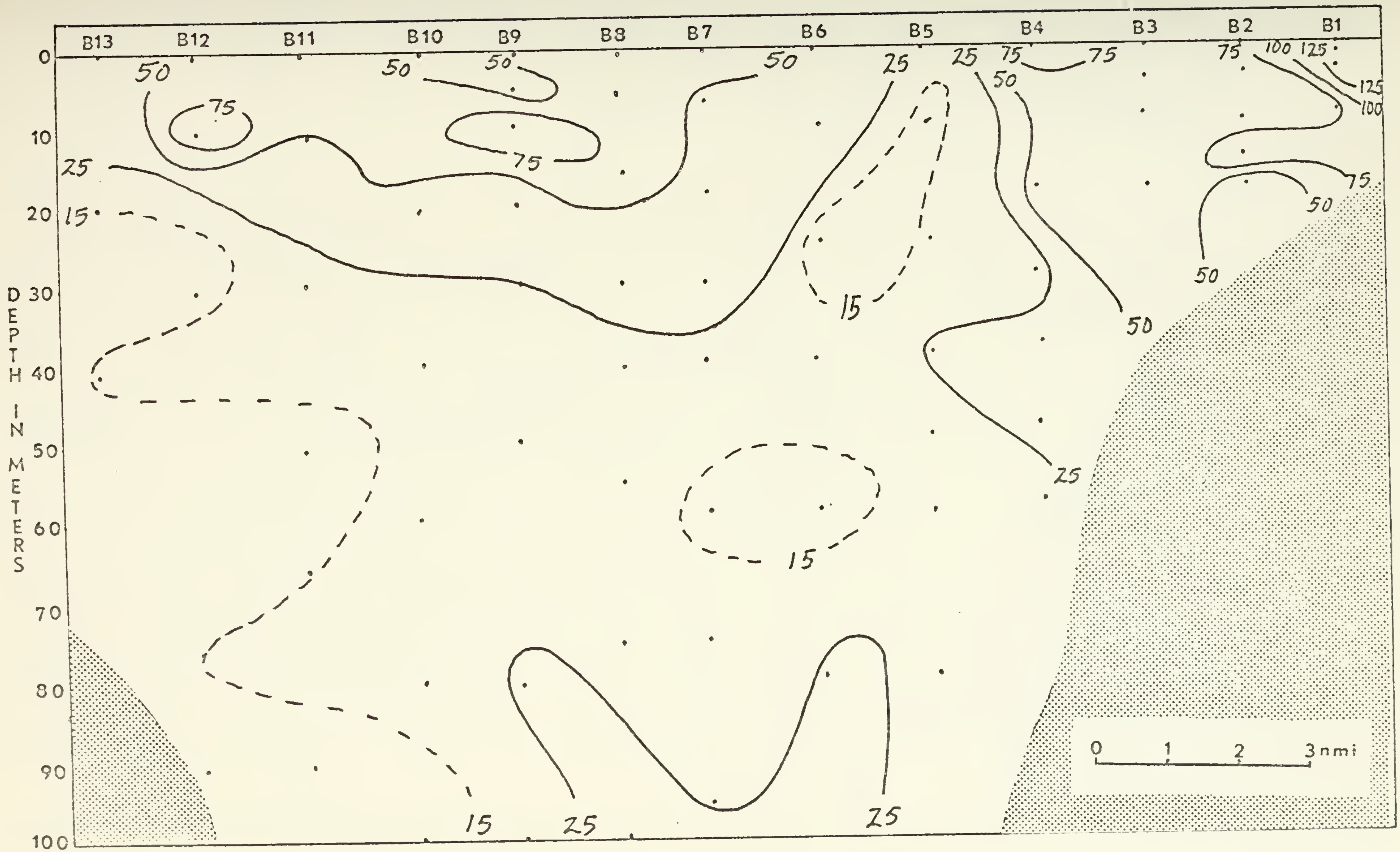


FIGURE 48. Profile of Total Coulter Count (x 10^{-3})

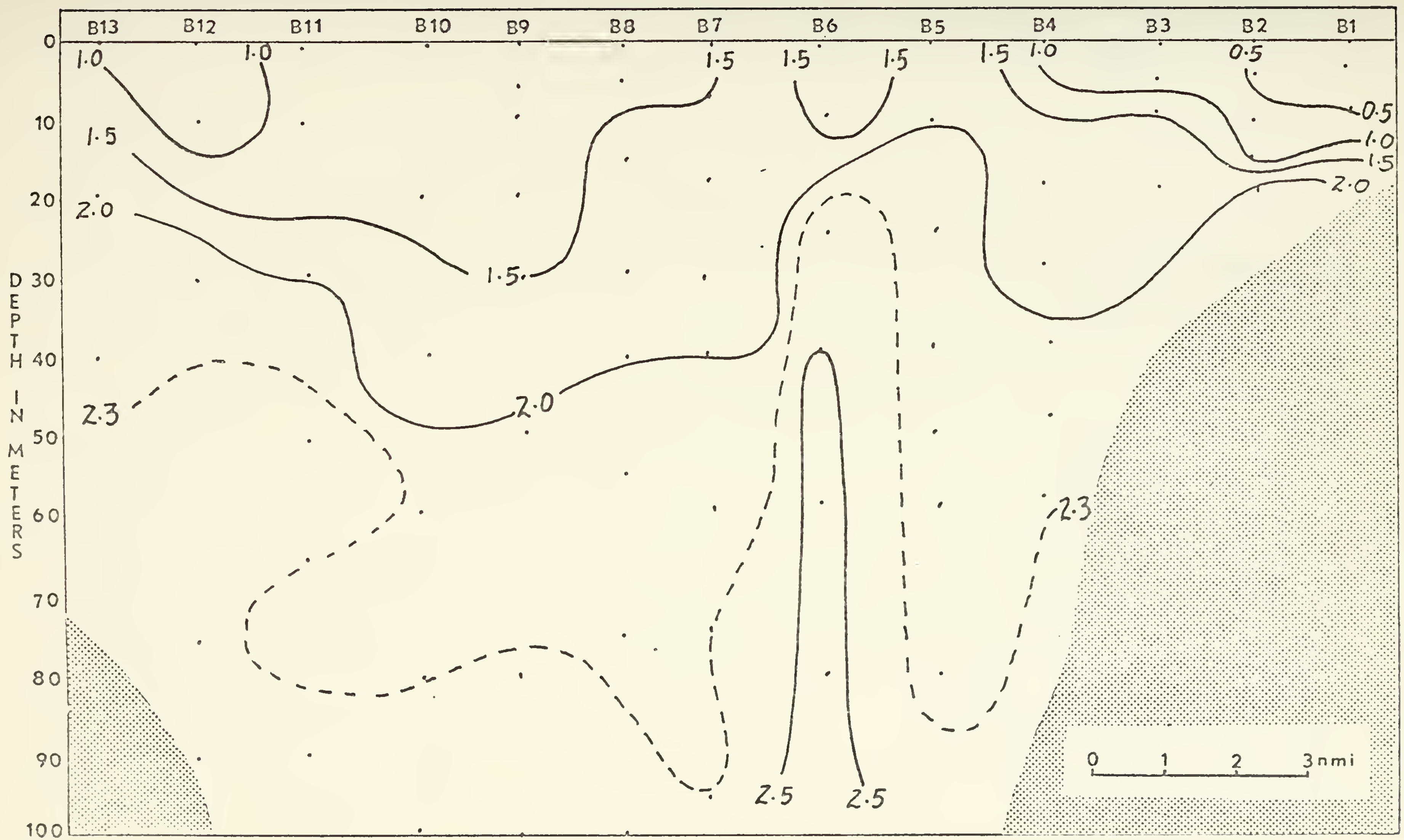


FIGURE 49. Profile of Phosphate (μg-at/l)

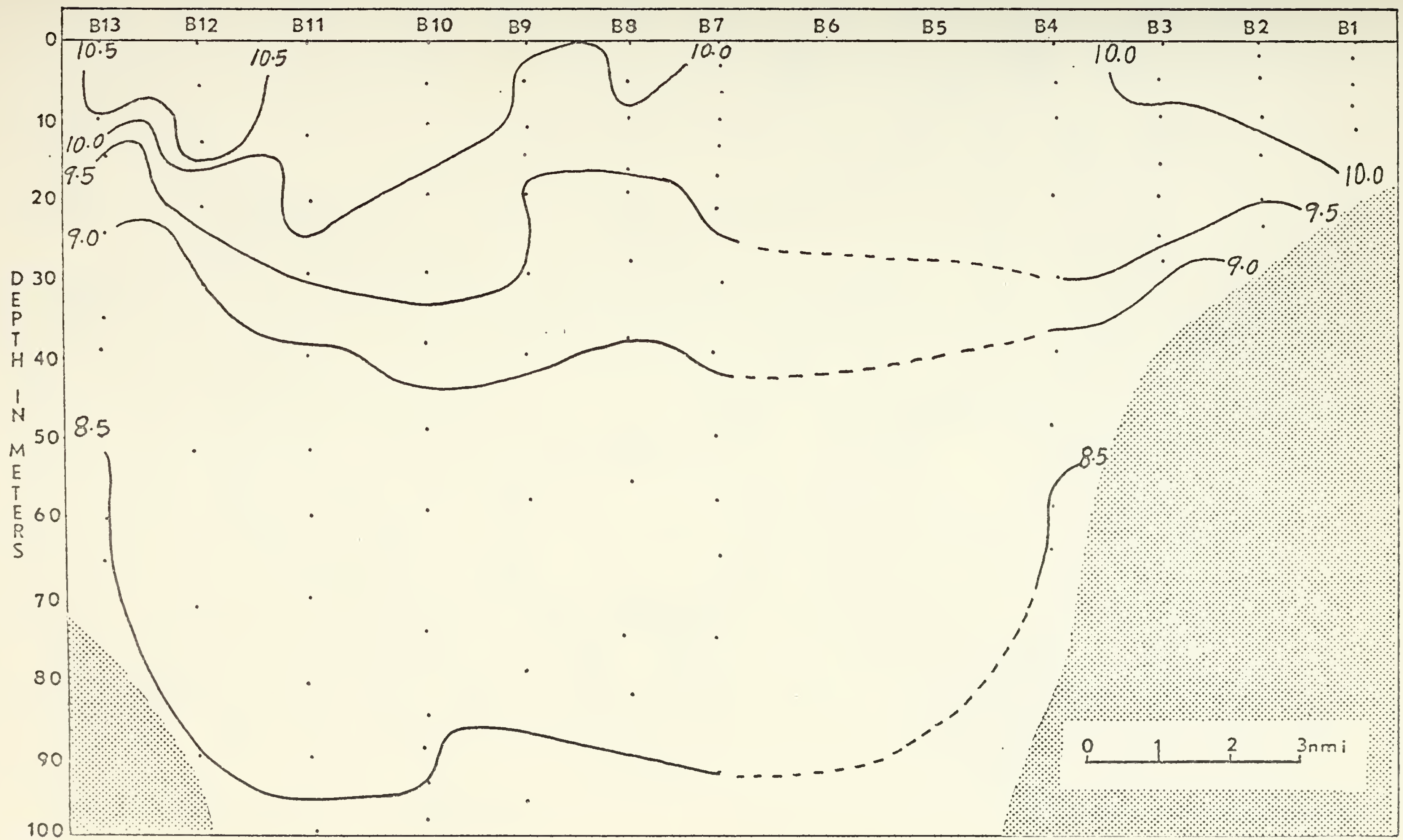


FIGURE 50. Profile of Temperature (^{o}C)

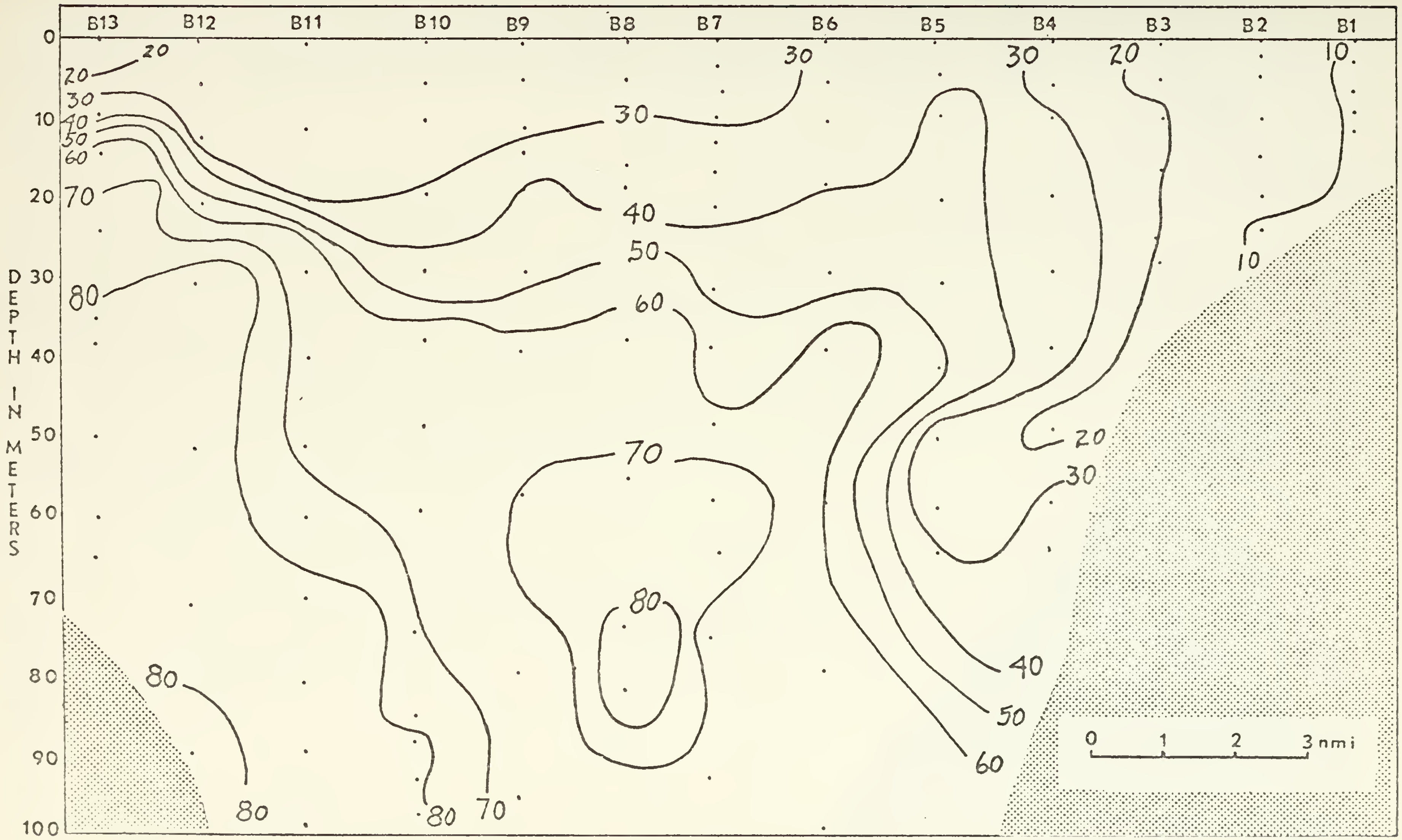


FIGURE 51. Profile of Beam Transmittance (%/m)

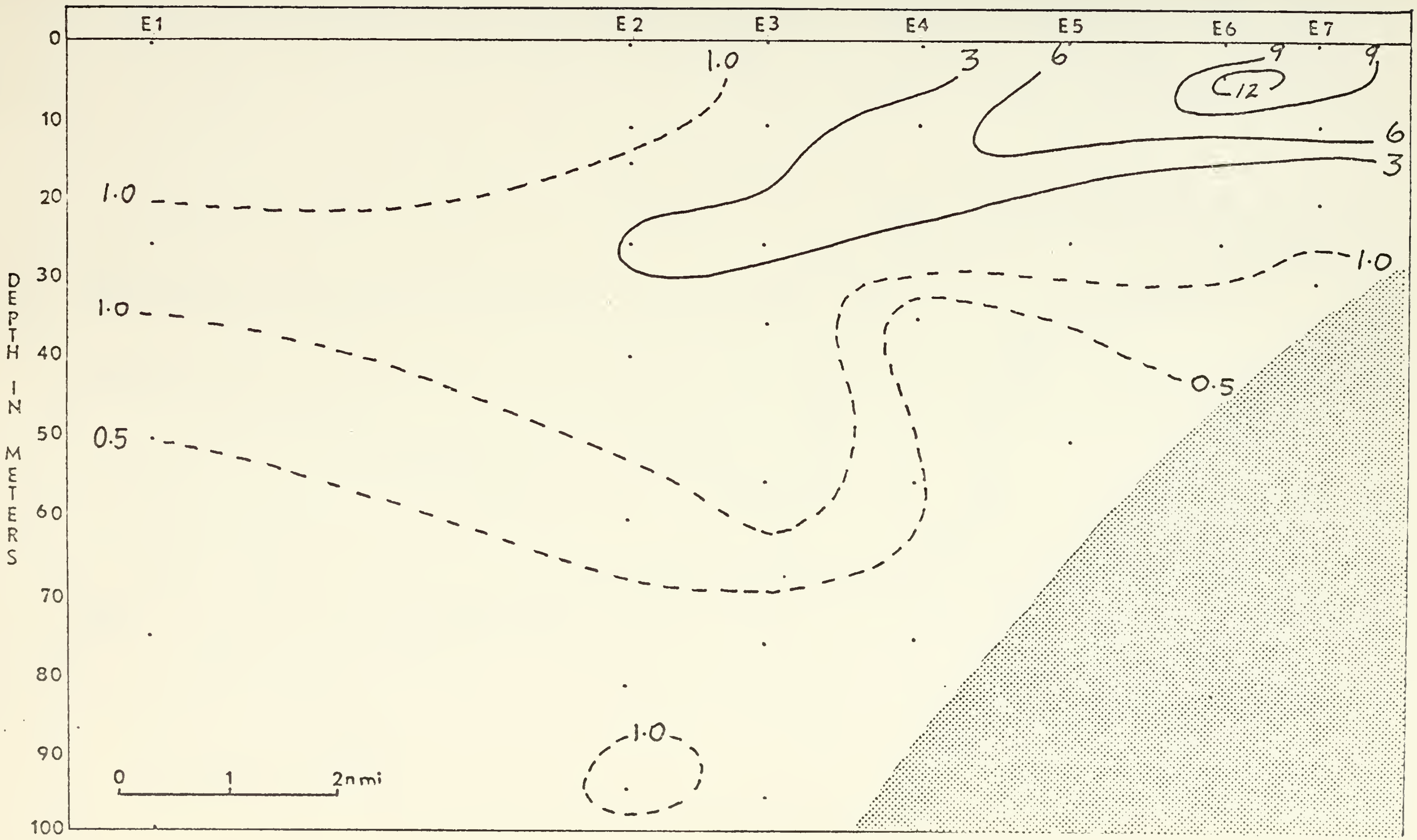


FIGURE 52. Profile of Chlorophyll a (mg/m^3)

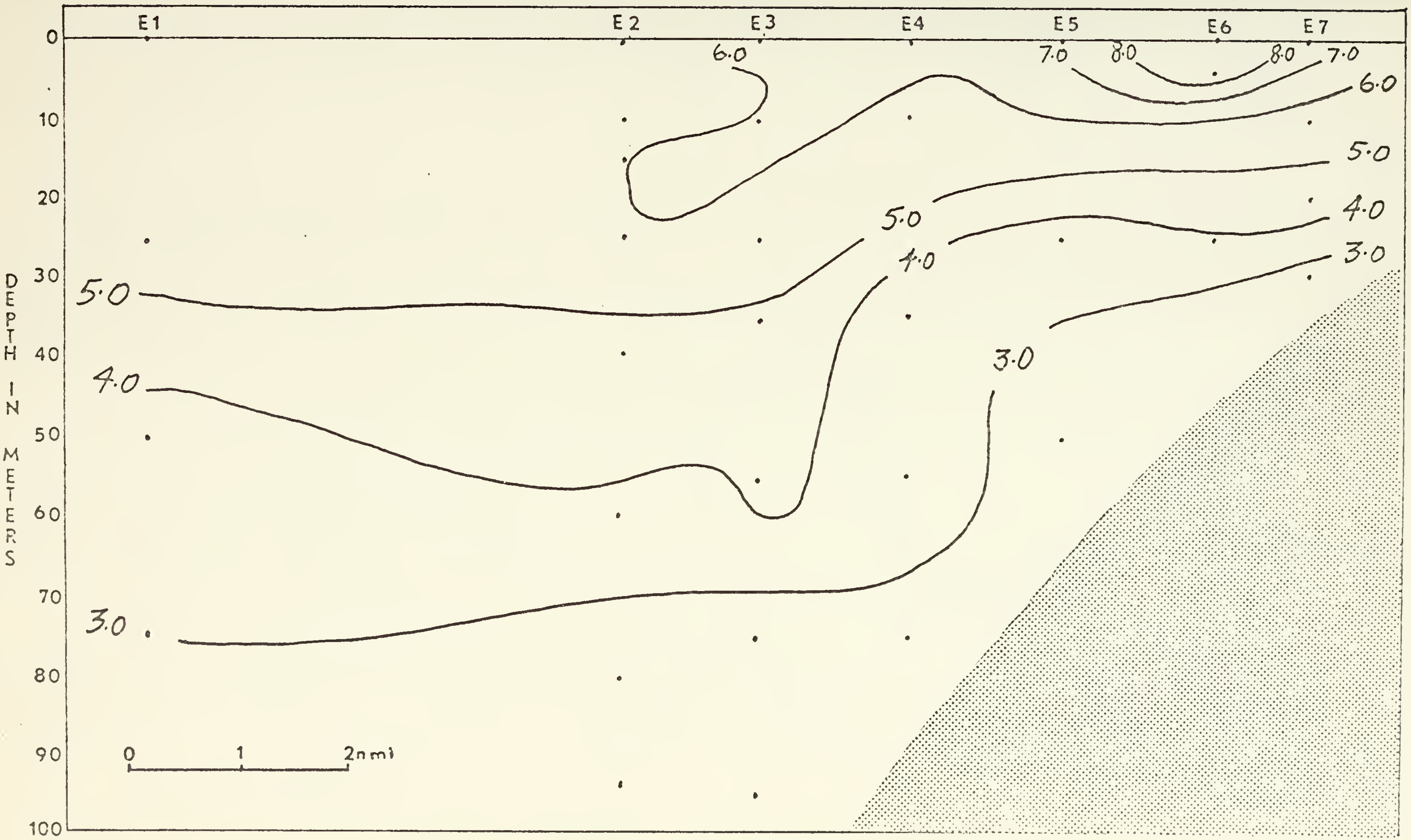


FIGURE 53. Profile of Oxygen (ml/1)

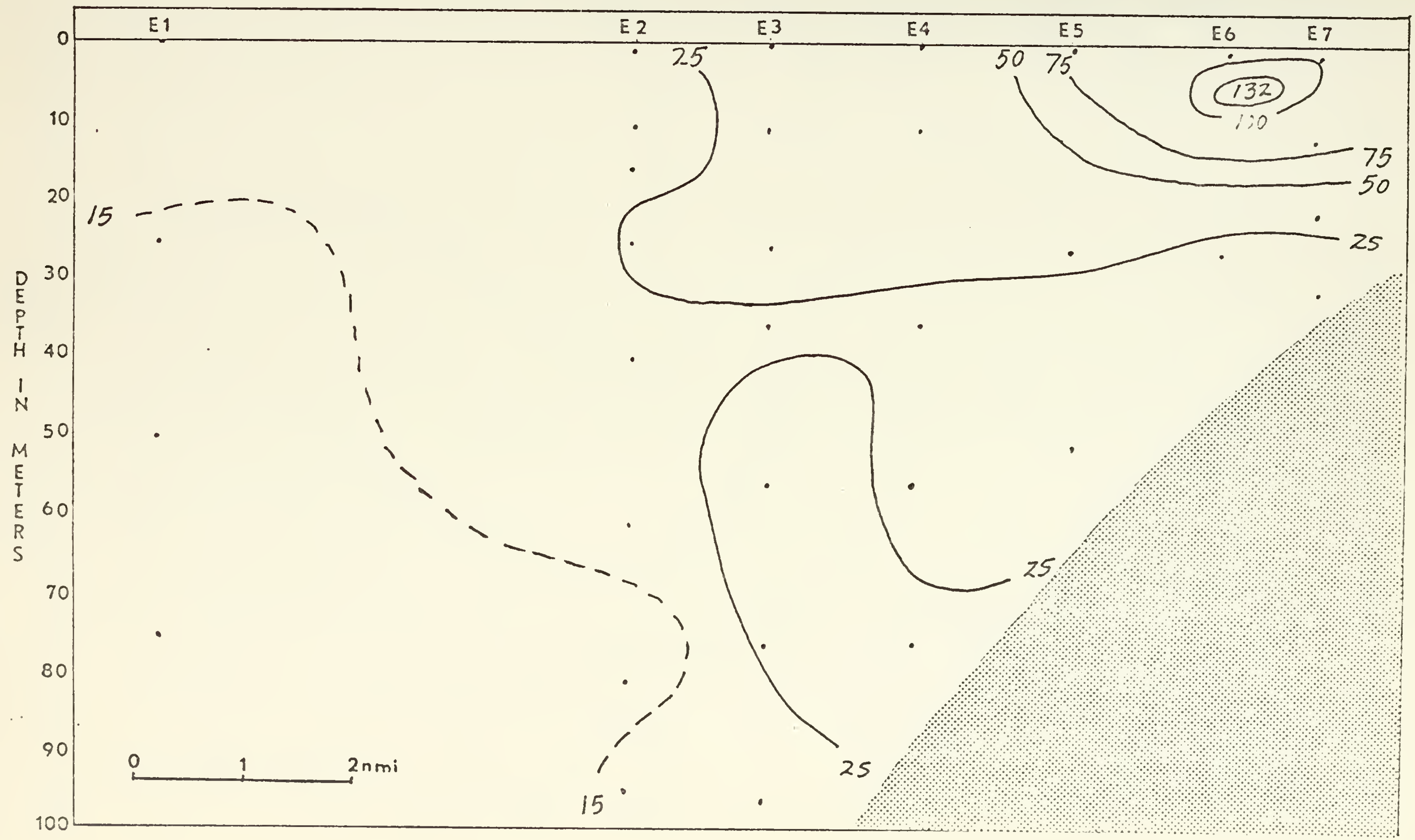


FIGURE 54. Profile of Total Coulter Count (x 10^{-3})

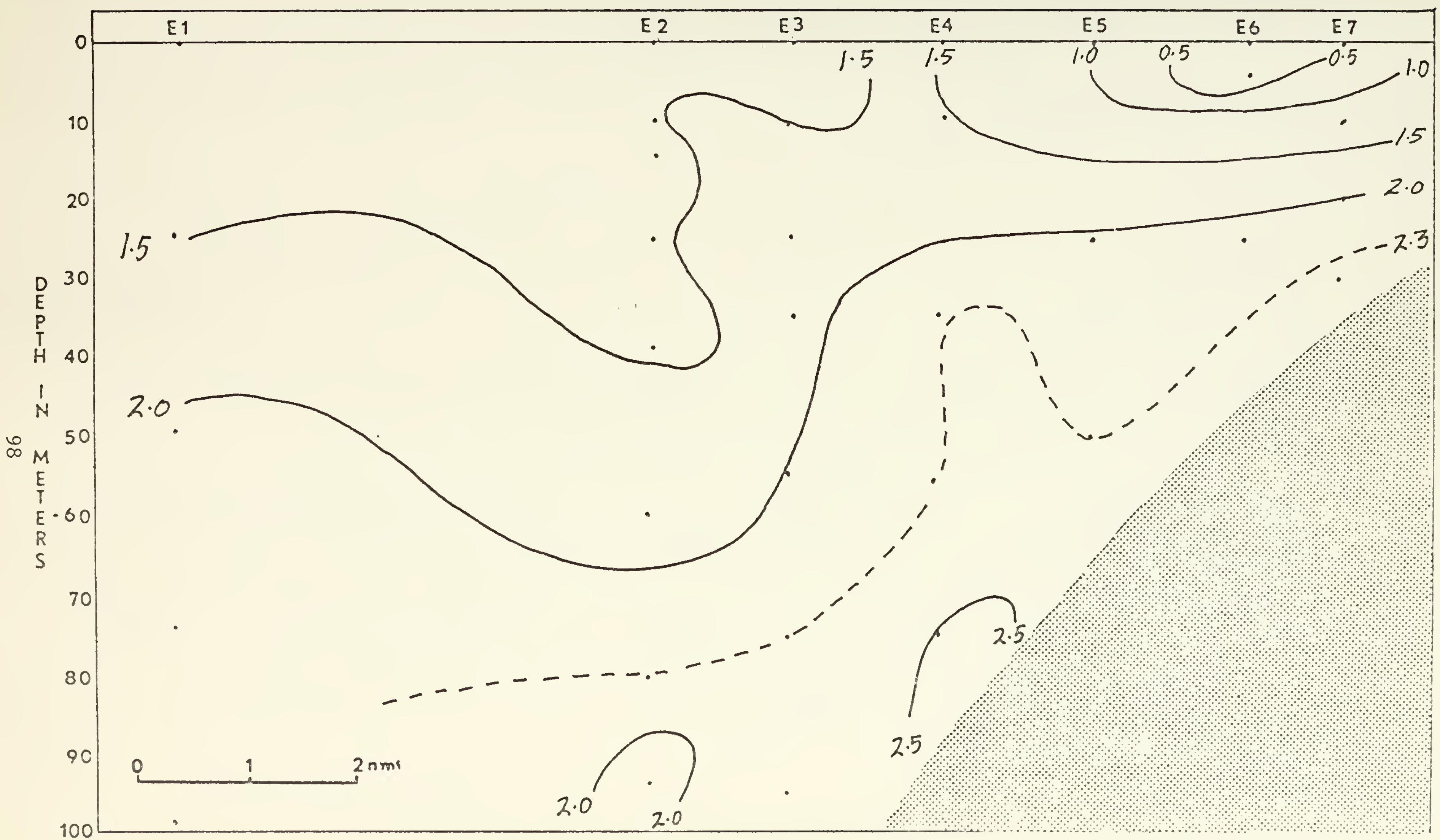


FIGURE 55. Profile of Phosphate (μg-at/l)

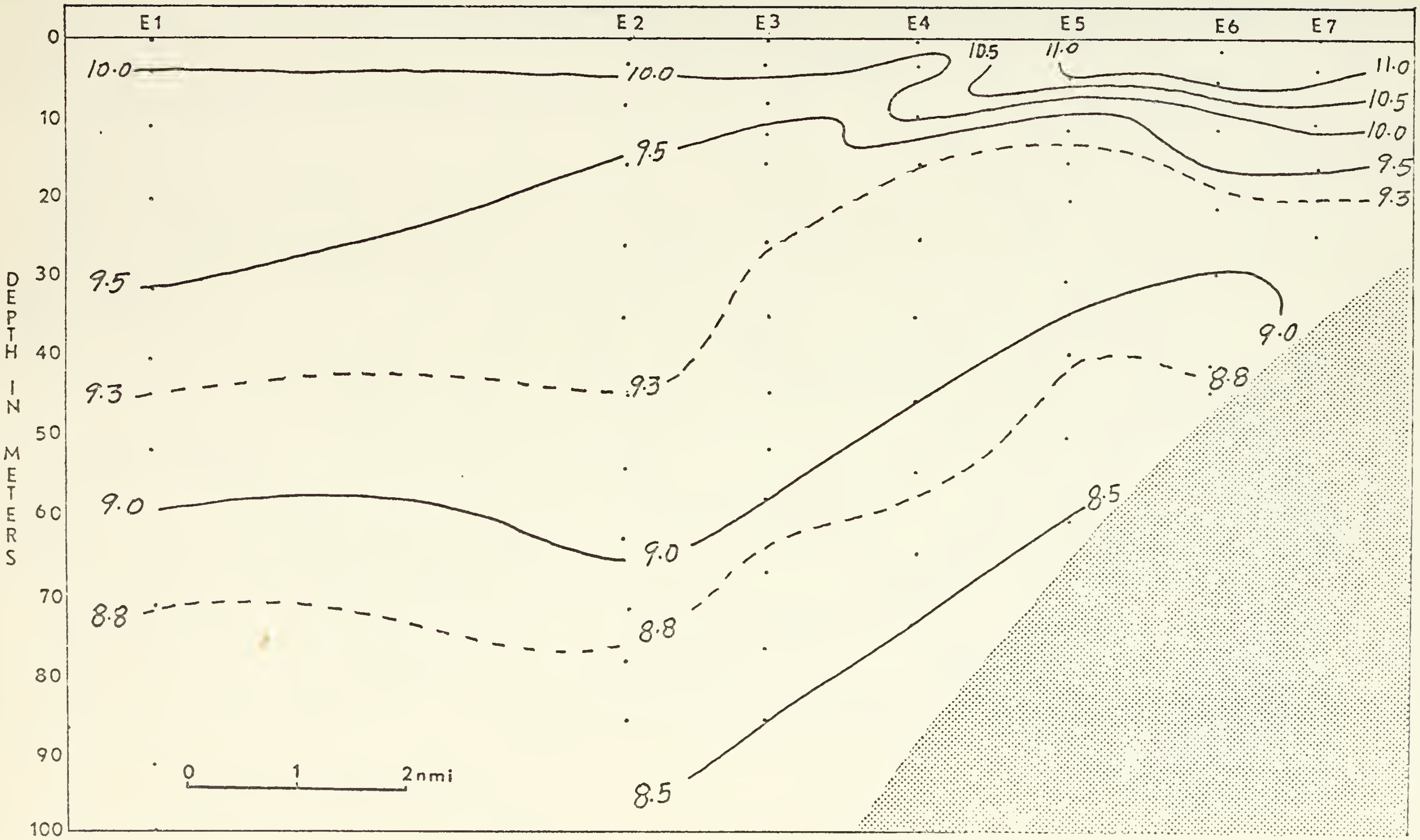


FIGURE 56. Profile of Temperature (^{o}C)

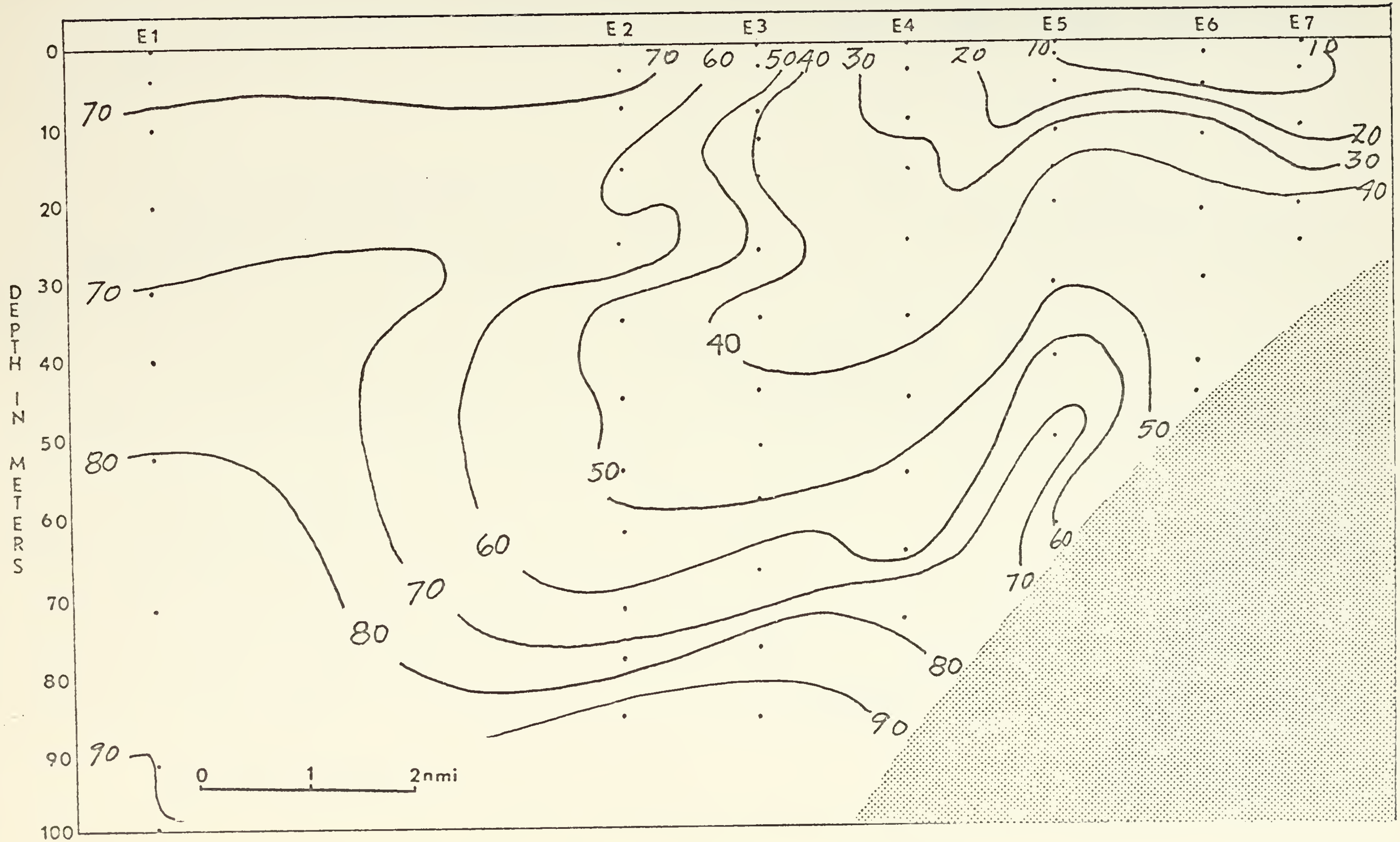


FIGURE 57. Profile of Beam Transmittance (%/m)

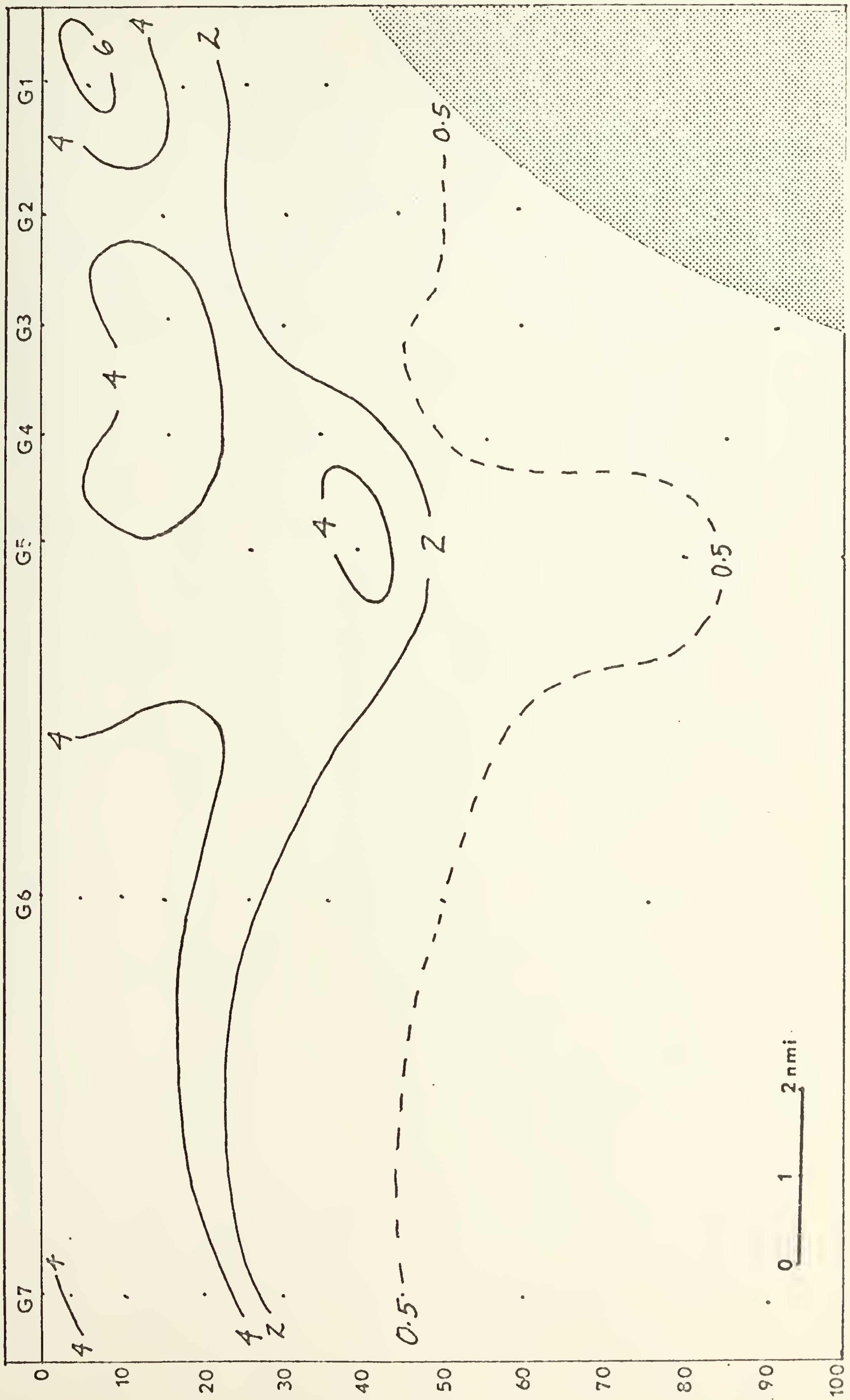


FIGURE 58. Profile of Chlorophyll a (mg/m^3)

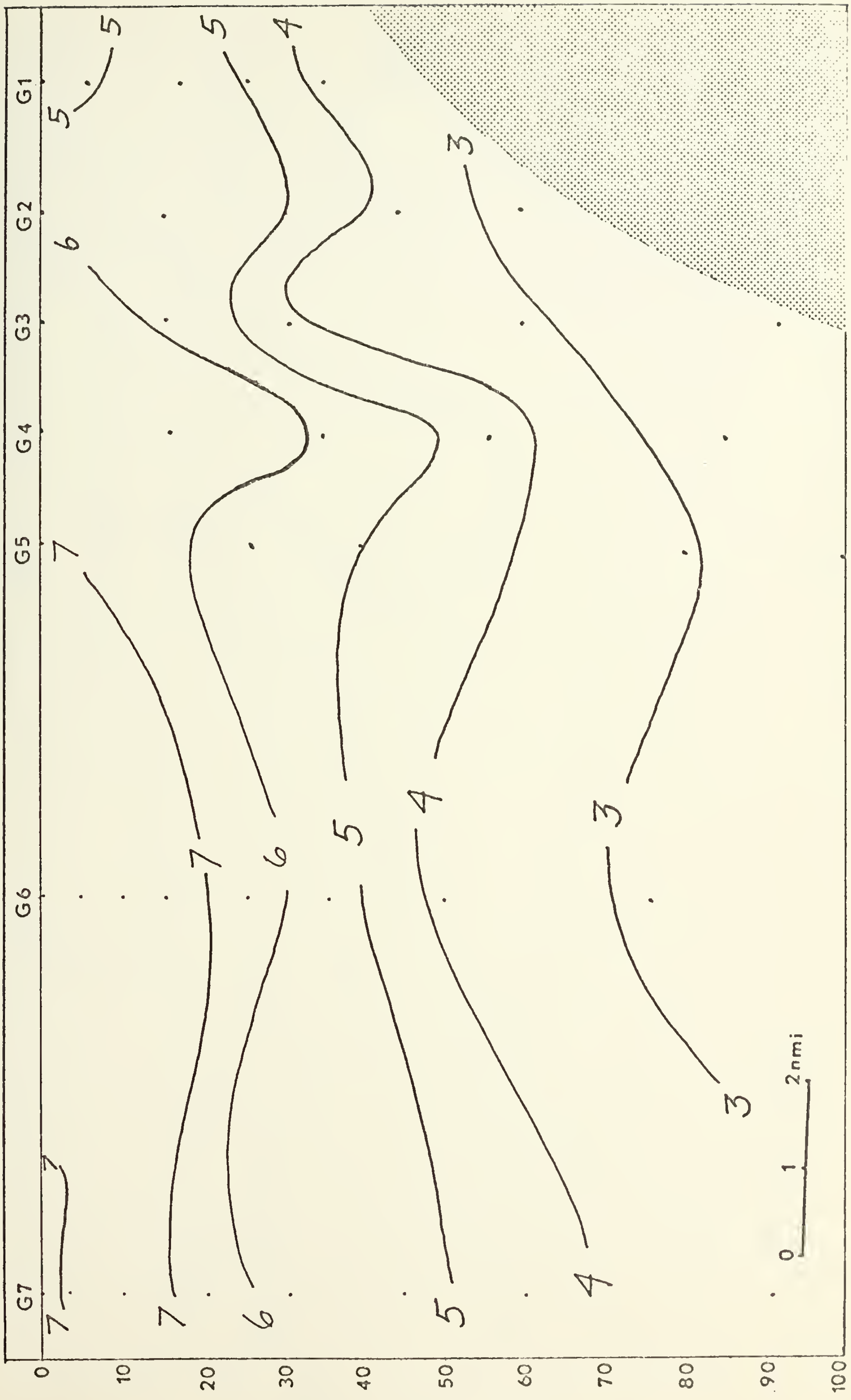


FIGURE 59. Profile of Oxygen (ml/1)

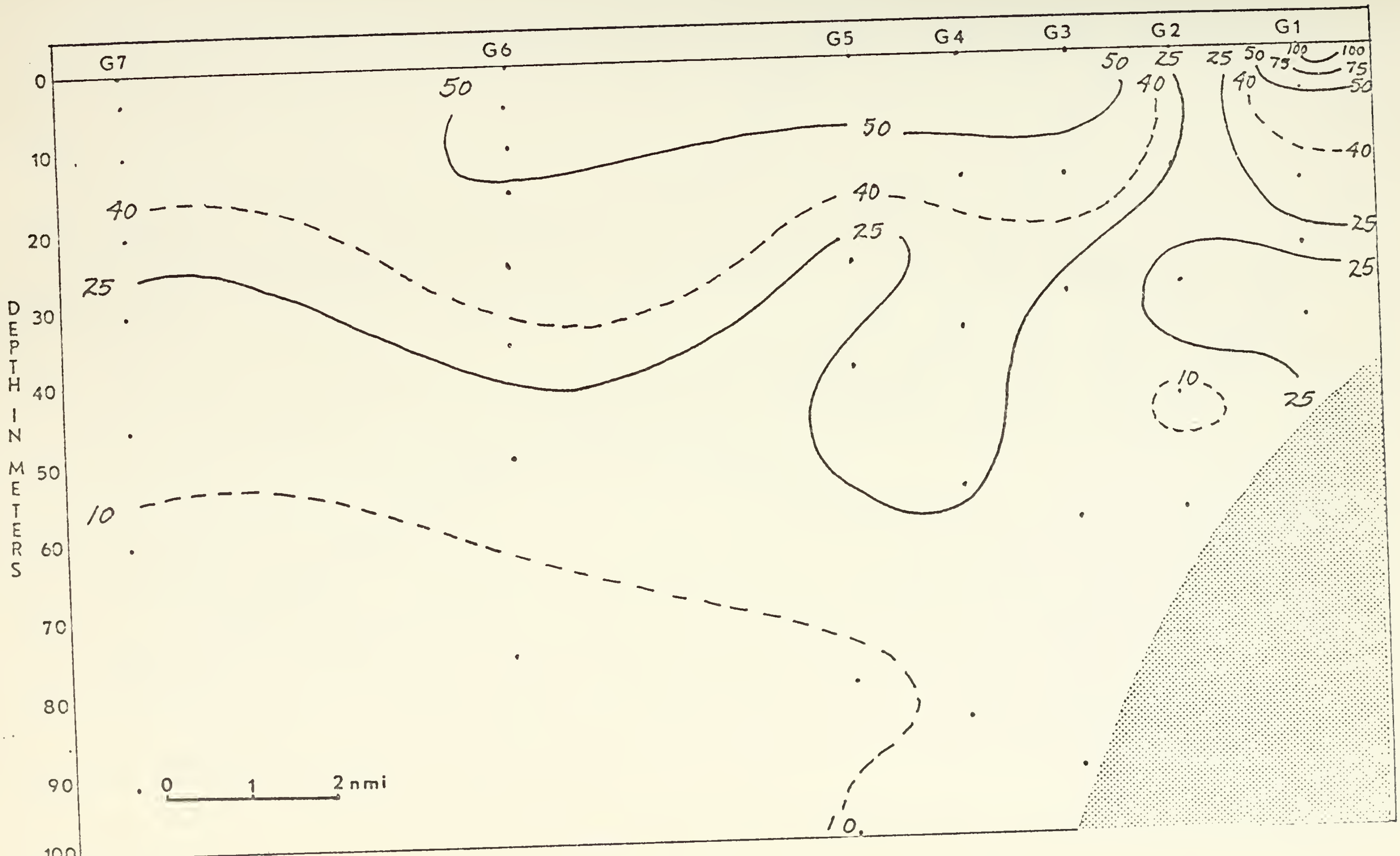


FIGURE 60. Profile of Total Coulter Count (x 10^{-3})

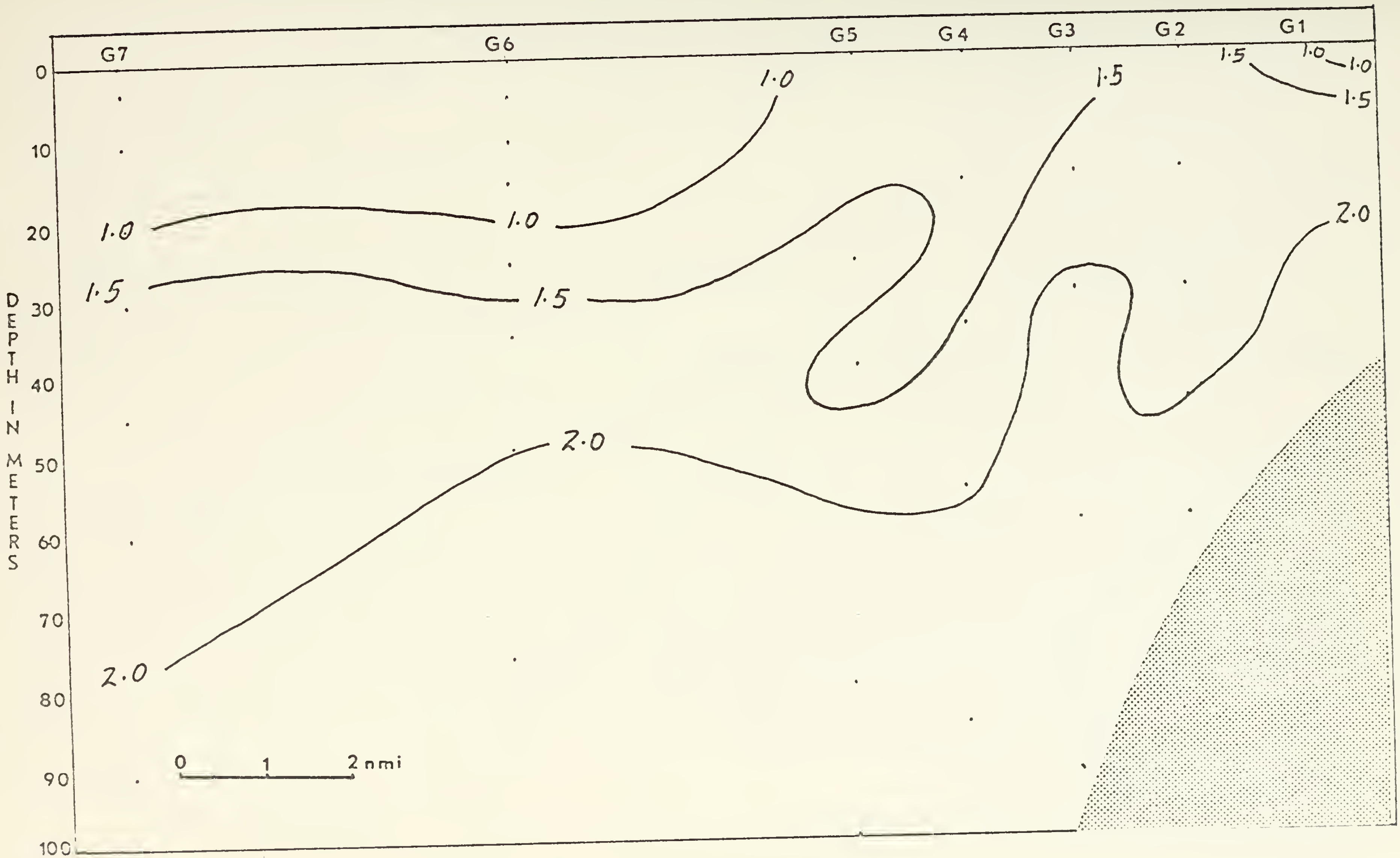


FIGURE 61. Profile of Phosphate (µg-at/1)

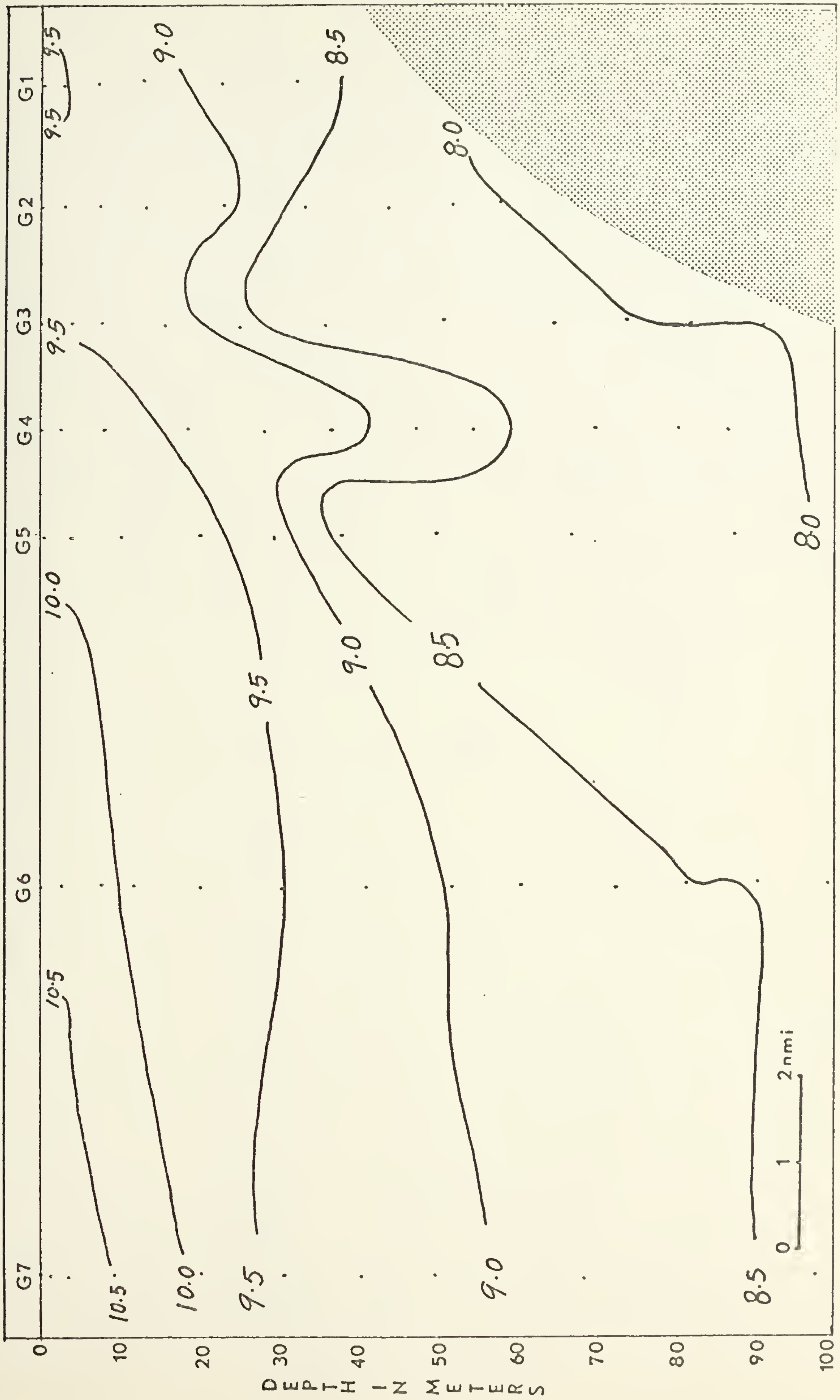


FIGURE 62. Profile of Temperature (°C)

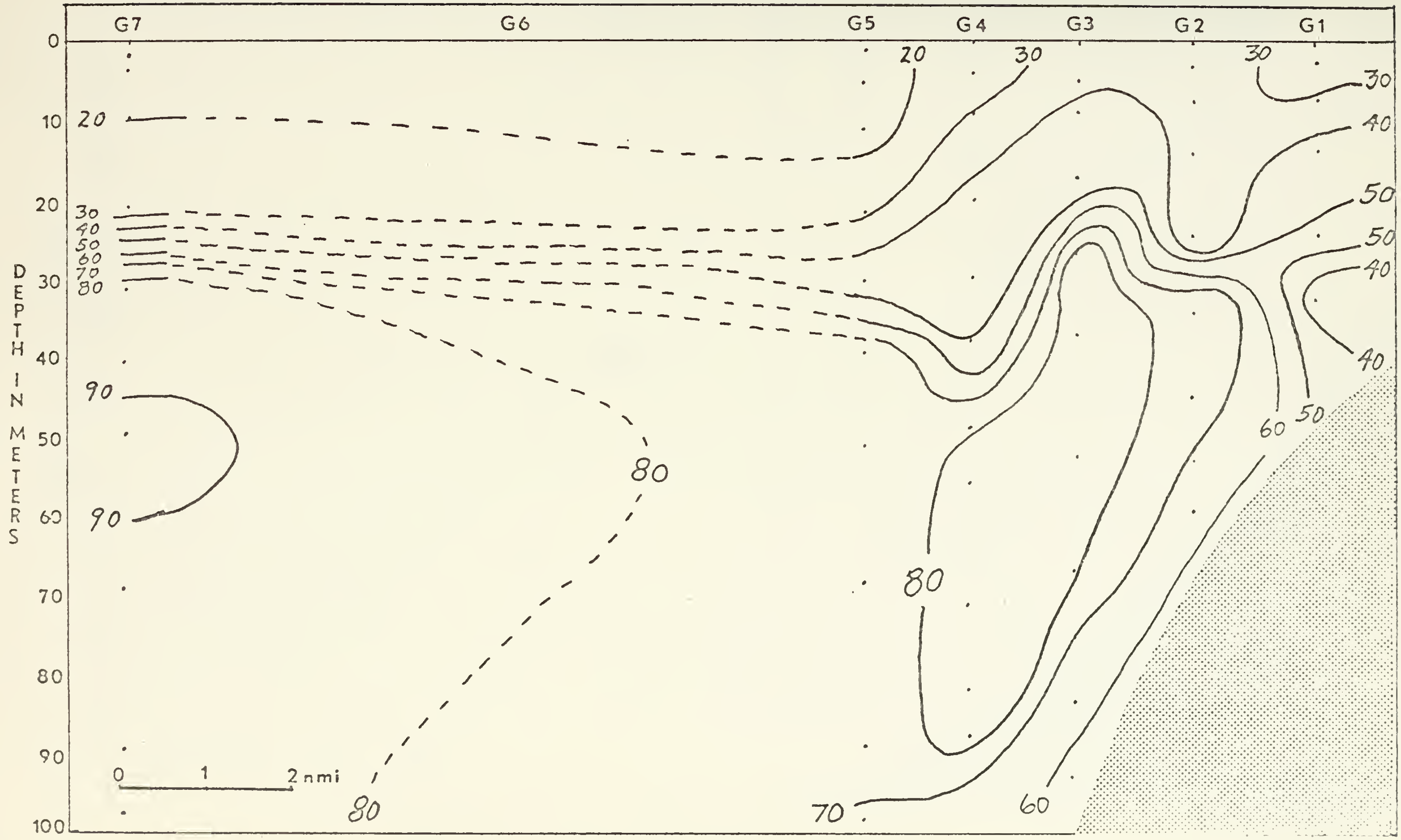


FIGURE 63. Profile of Beam Transmittance (%/m)

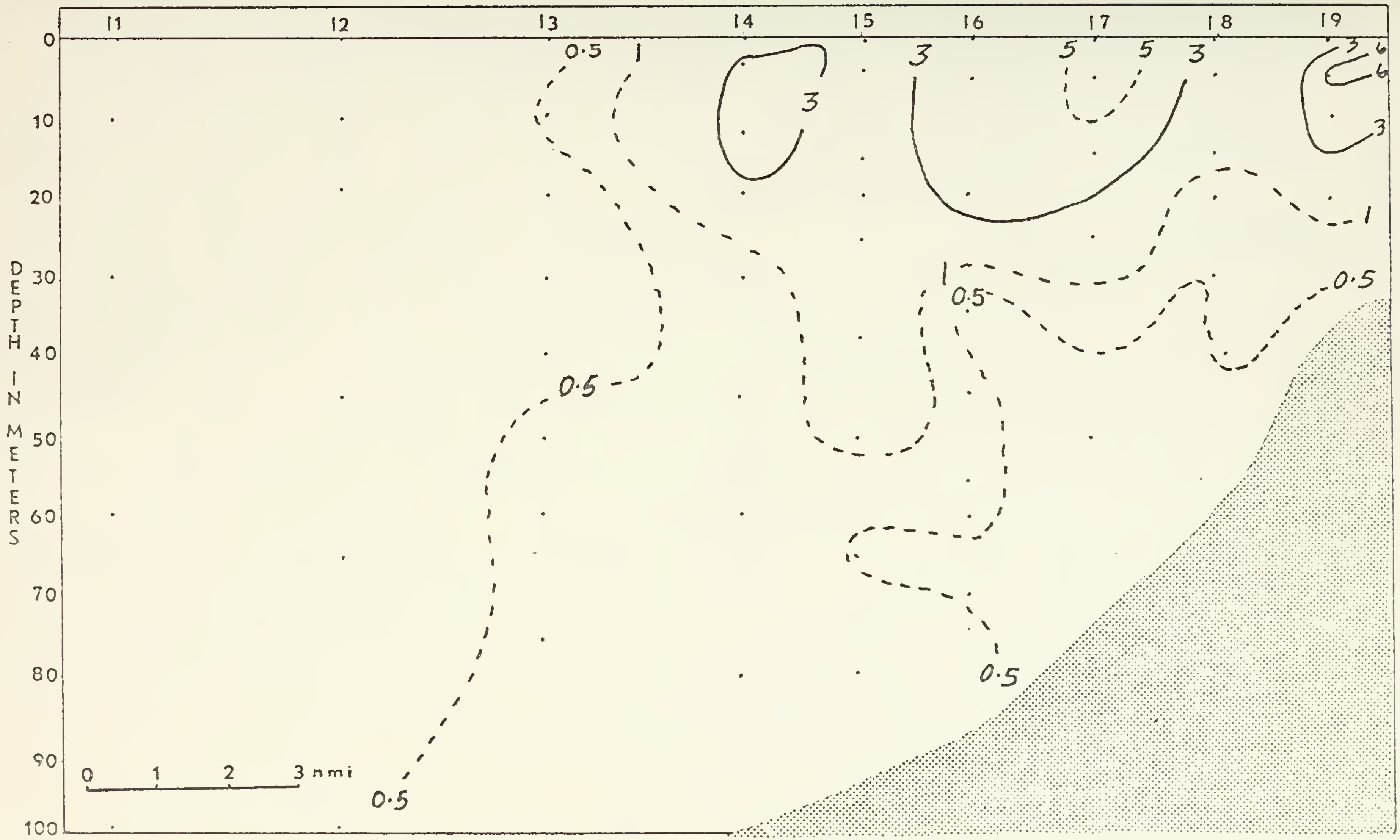


FIGURE 64. Profile of Chlorophyll a (mg/m^3)

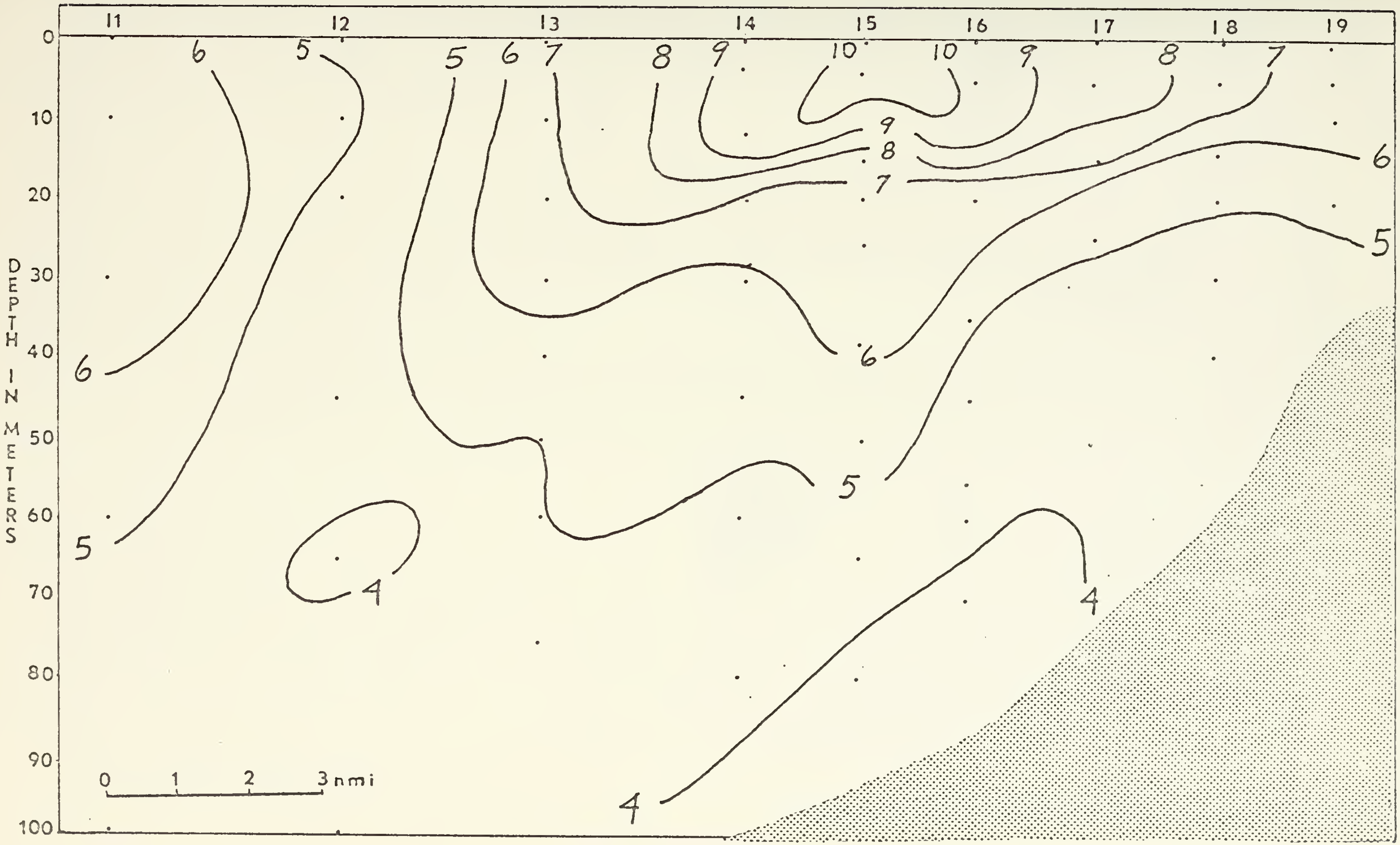


FIGURE 65. Profile of Oxygen (ml/1)

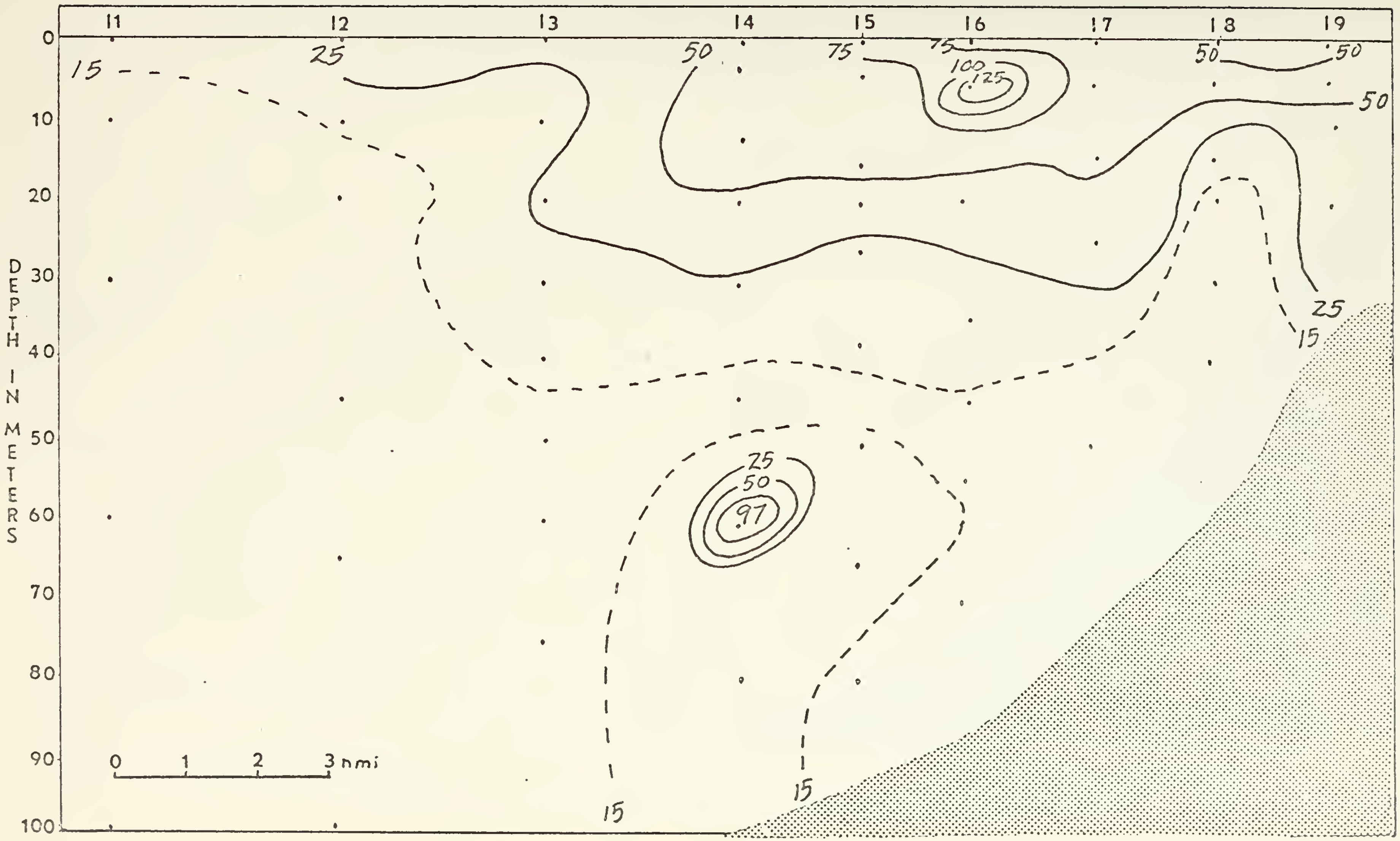


FIGURE 66. Profile of Total Coulter Count (x 10^{-3})

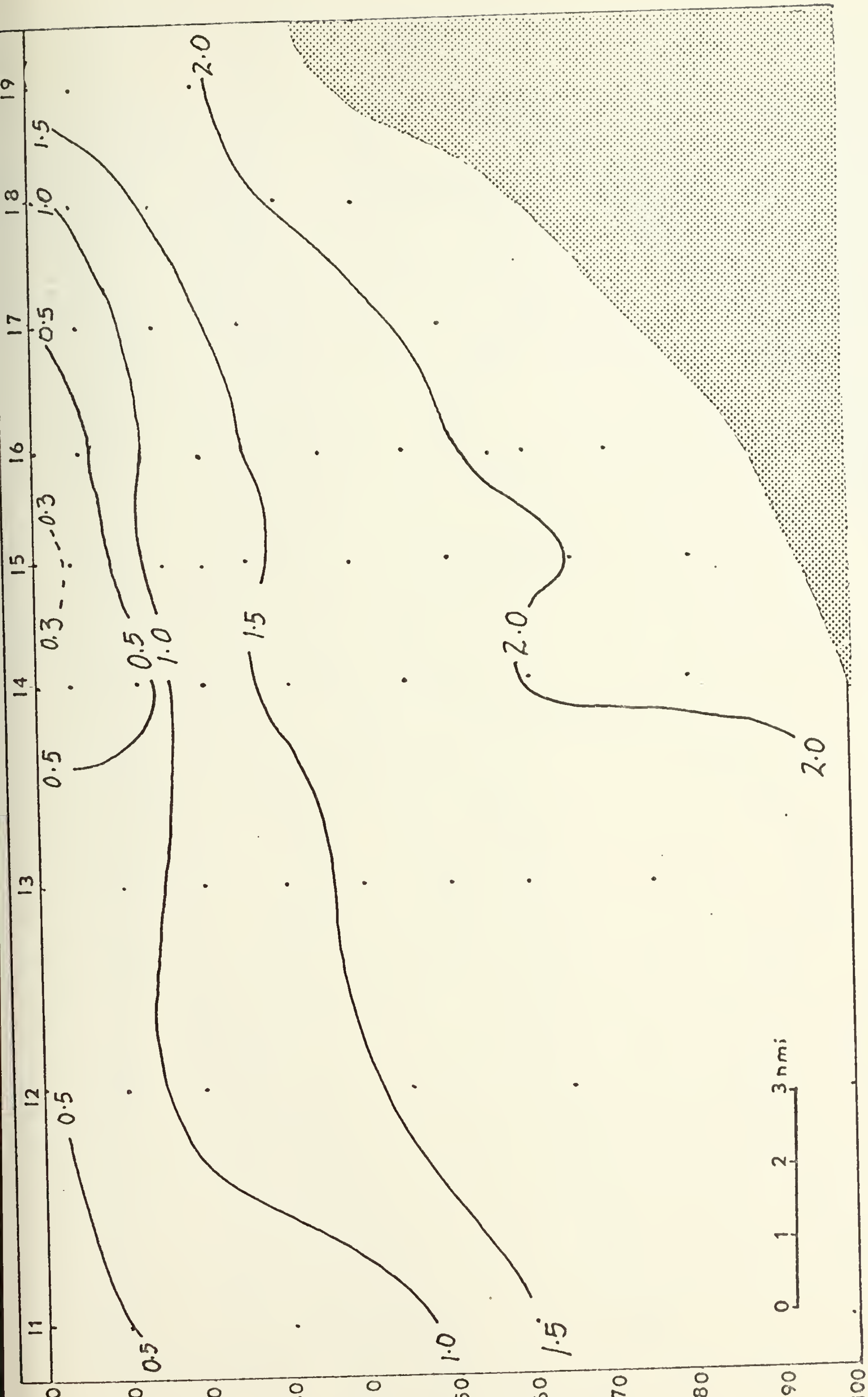


FIGURE 67. Profile of Phosphate (μg-at/l)

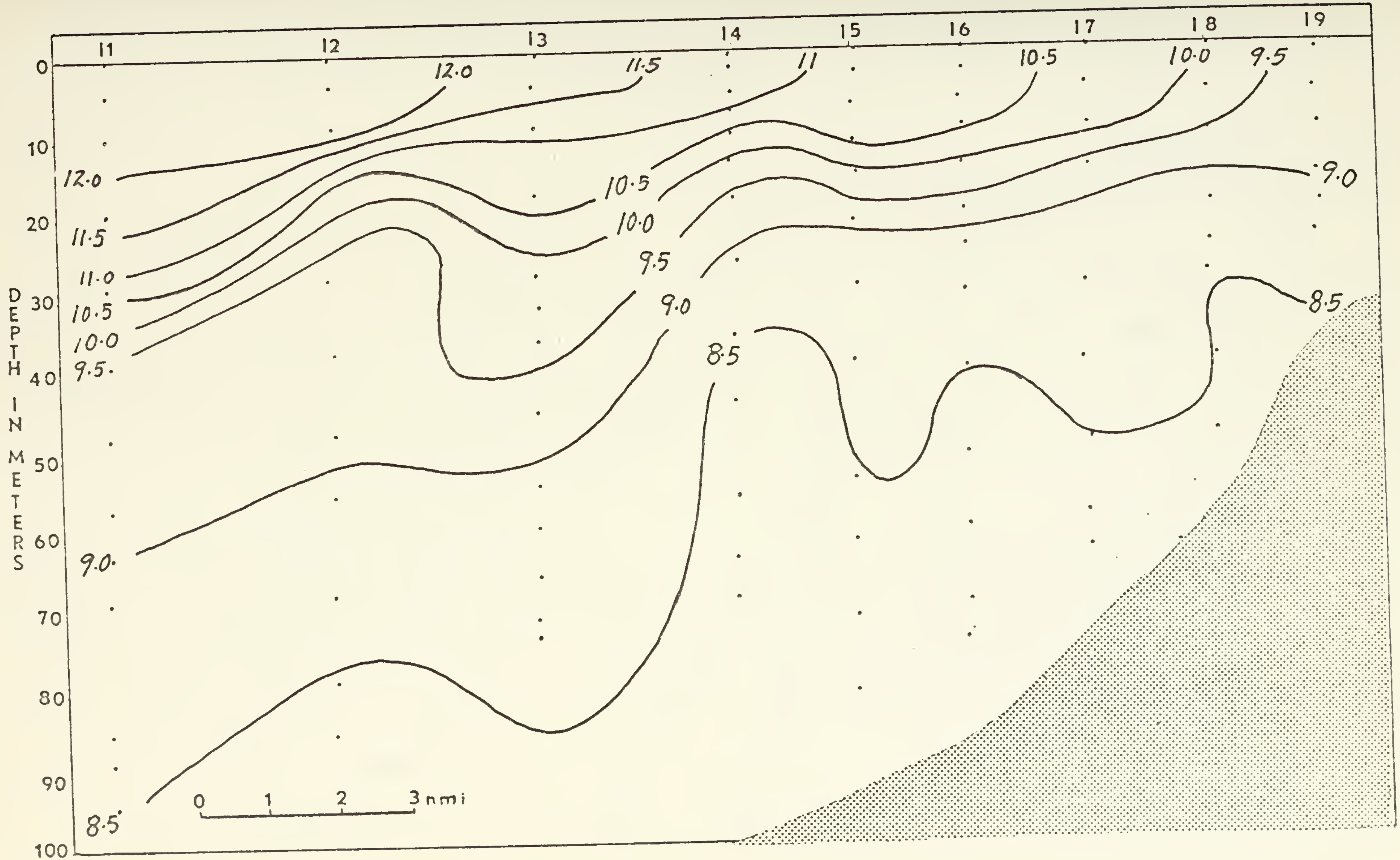


FIGURE 68. Profile of Temperature (^{o}C)

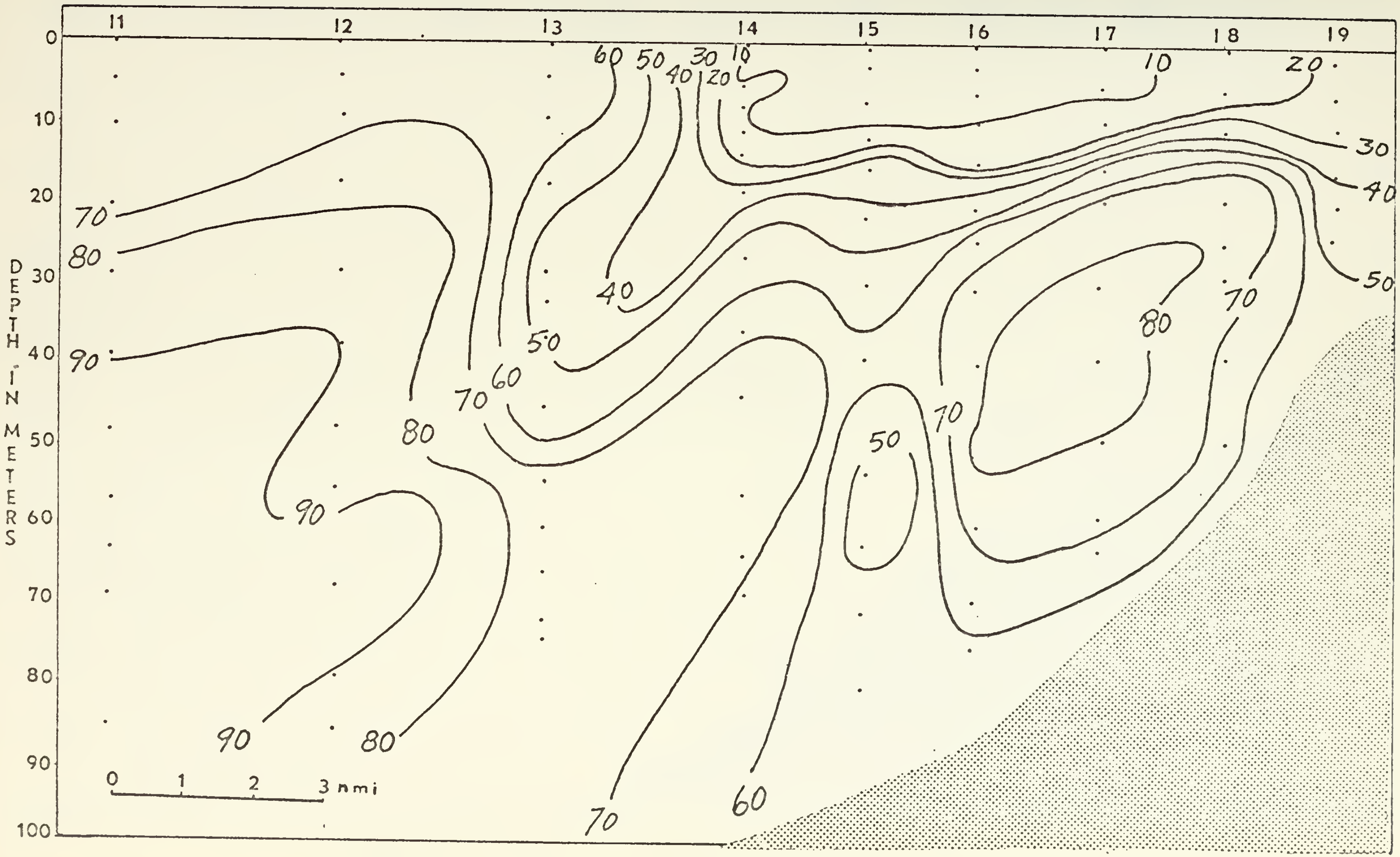


FIGURE 69. Profile of Beam Transmission (%/m)

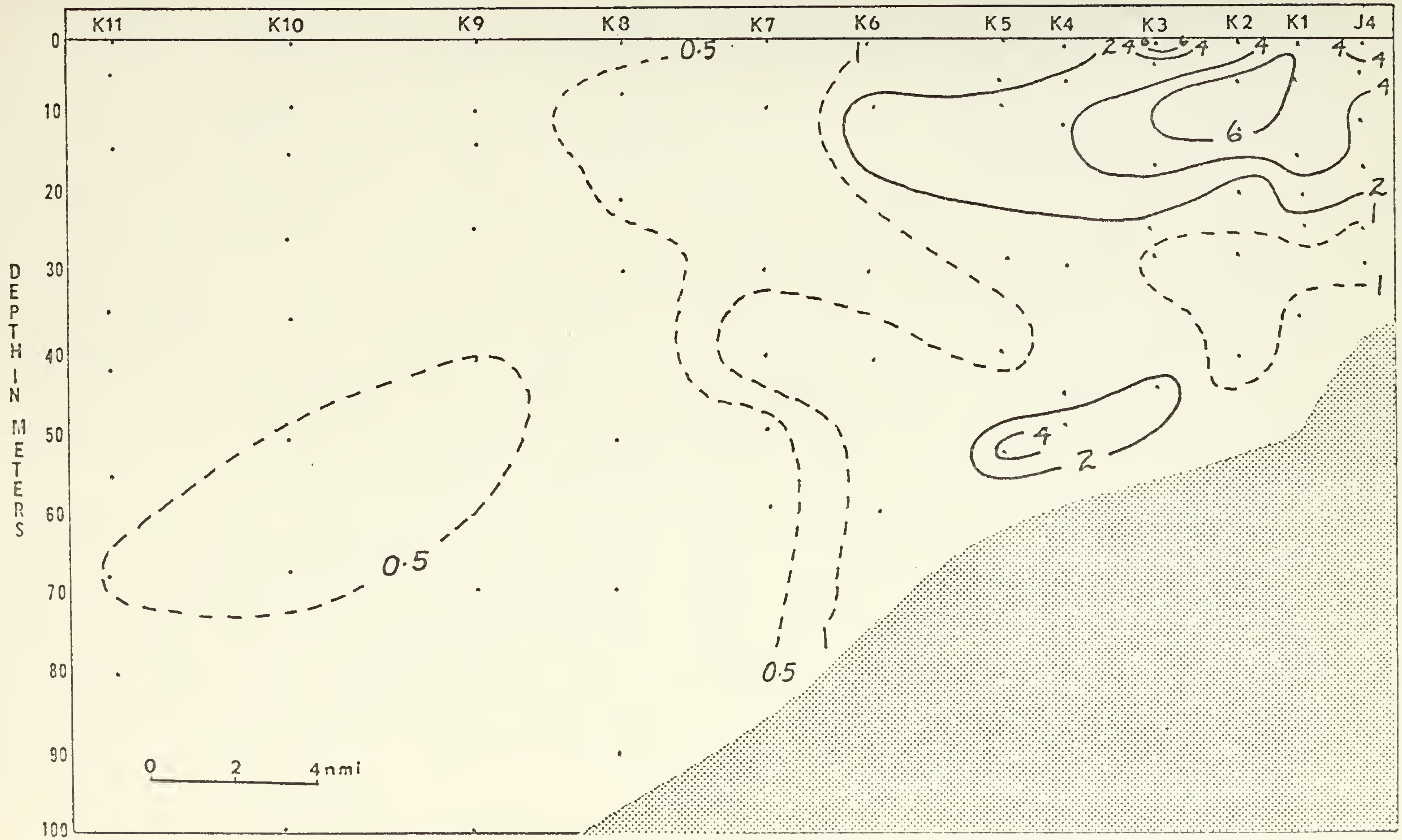


FIGURE 70. Profile of Chlorophyll a (mg/m^3)

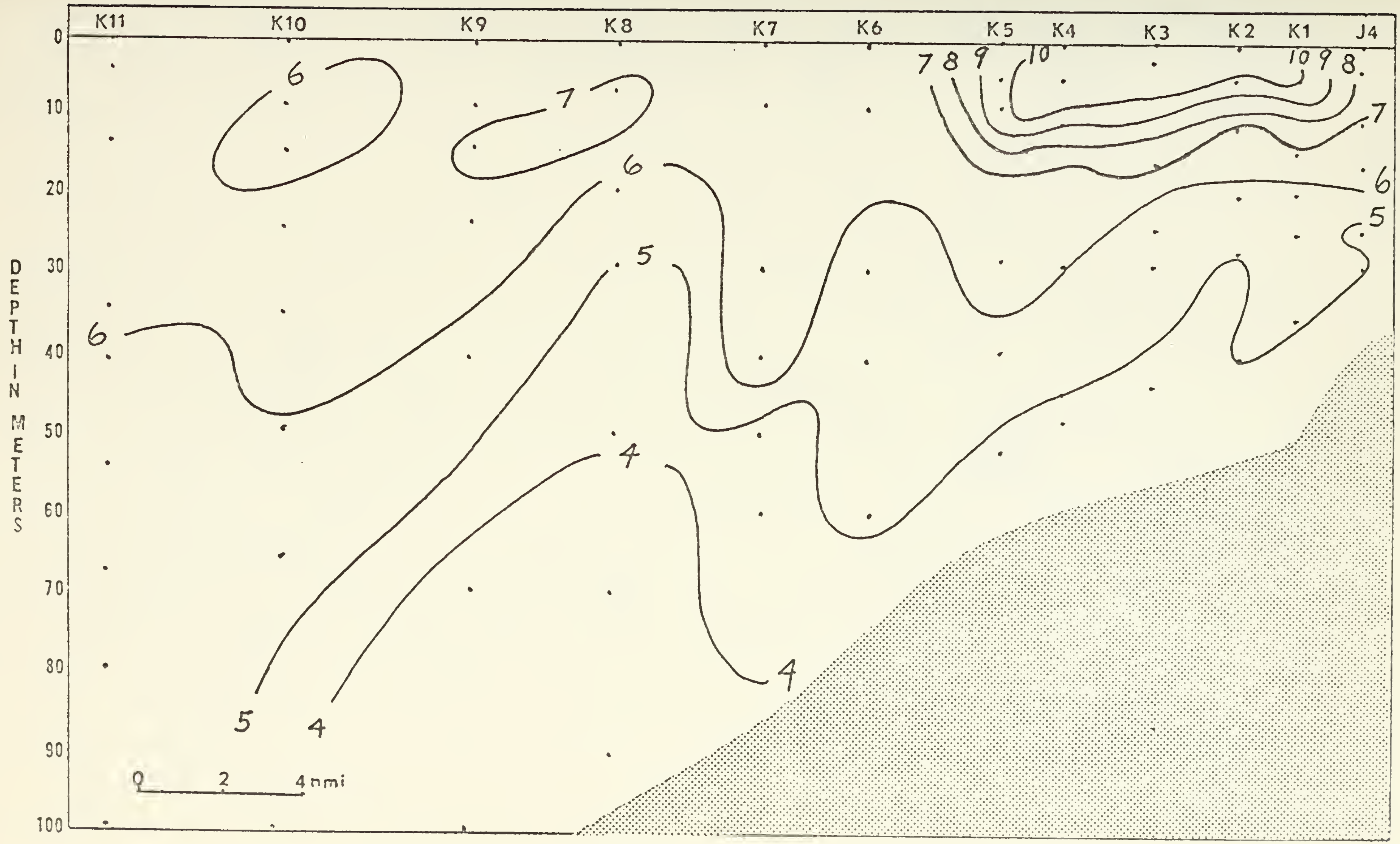


FIGURE 71. Profile of Oxygen (ml/l)

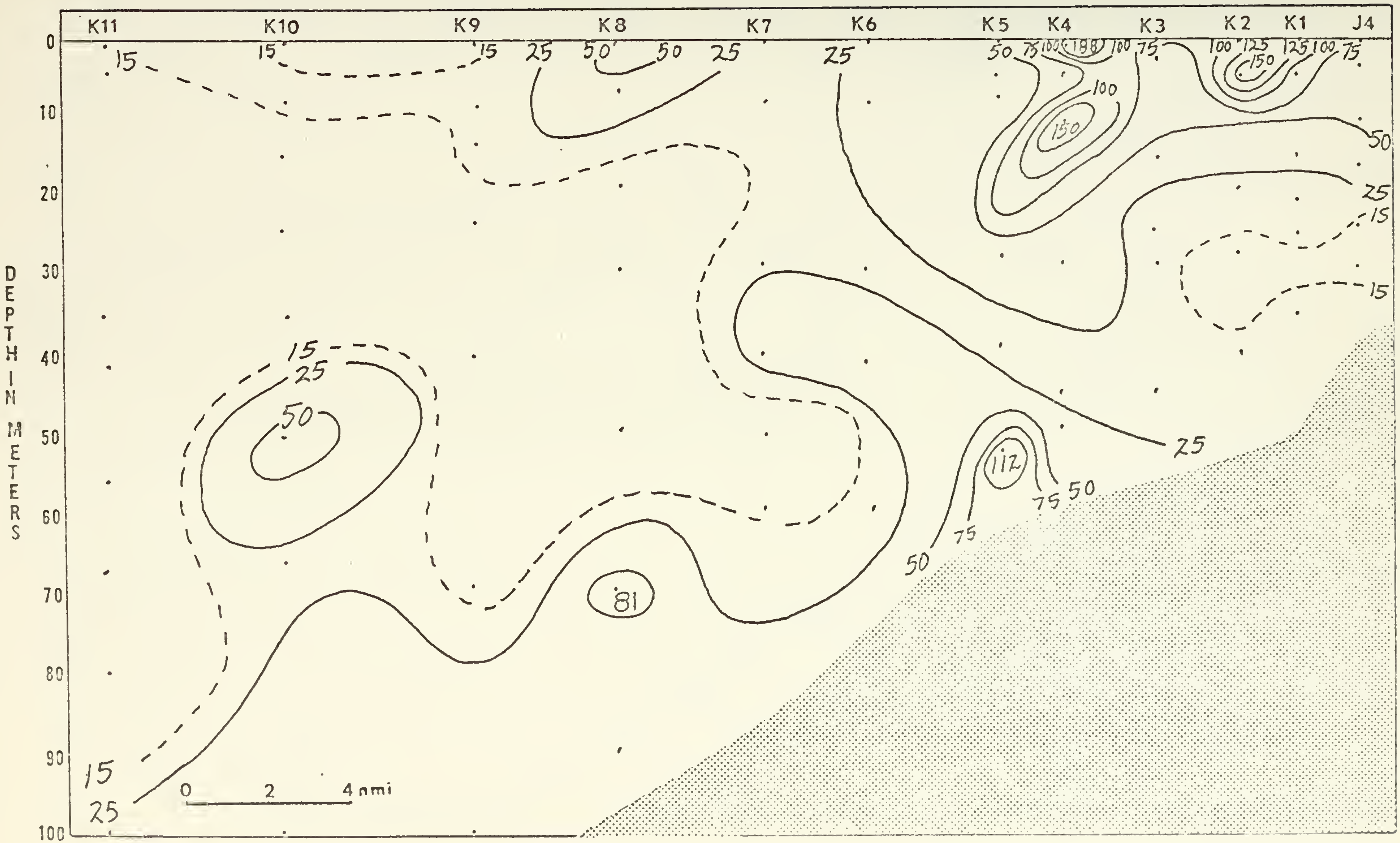


FIGURE 72. Profile of Total Coulter Count (x 10^{-3})

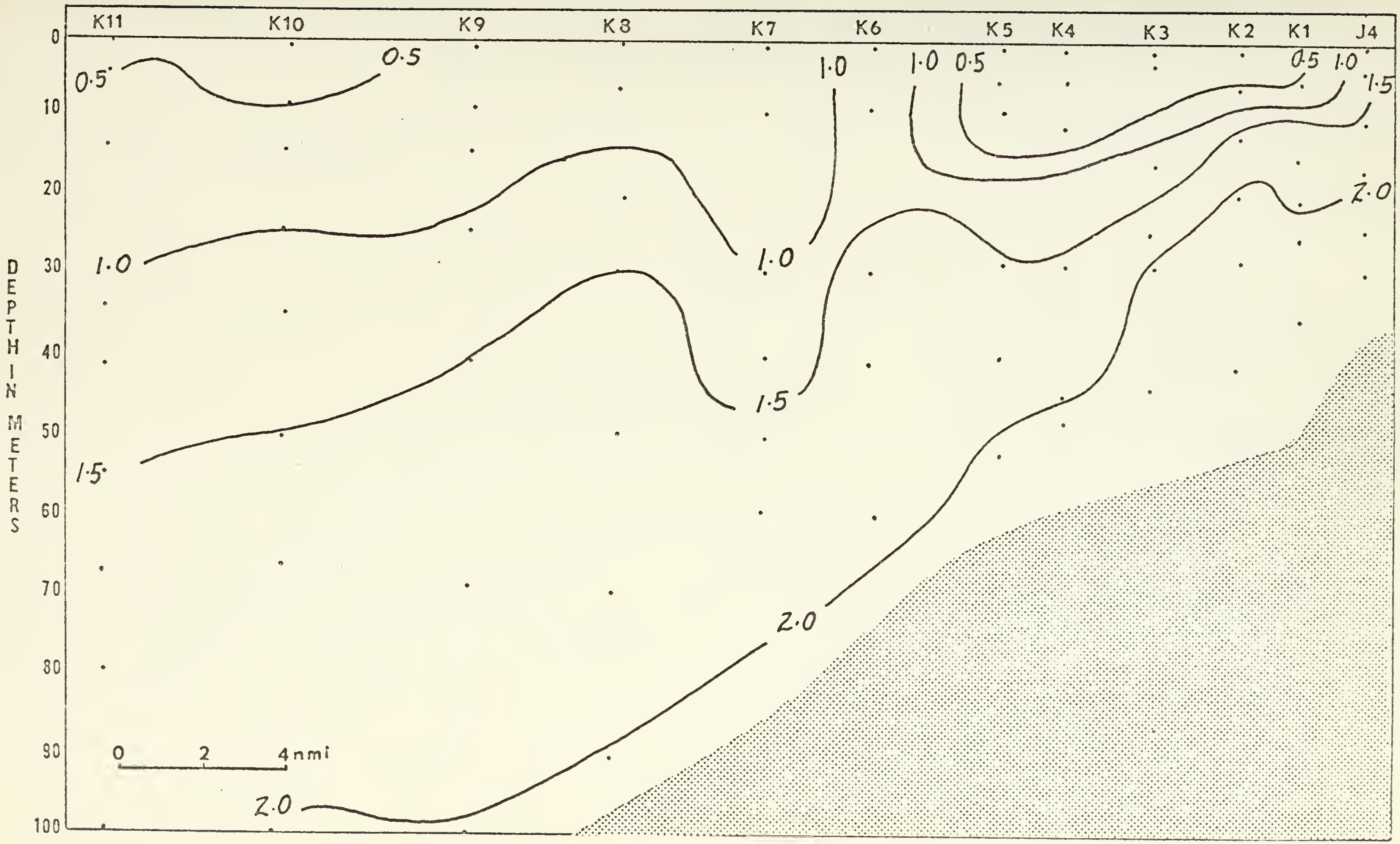


FIGURE 73. Profile of Phosphate (μg-at/l)

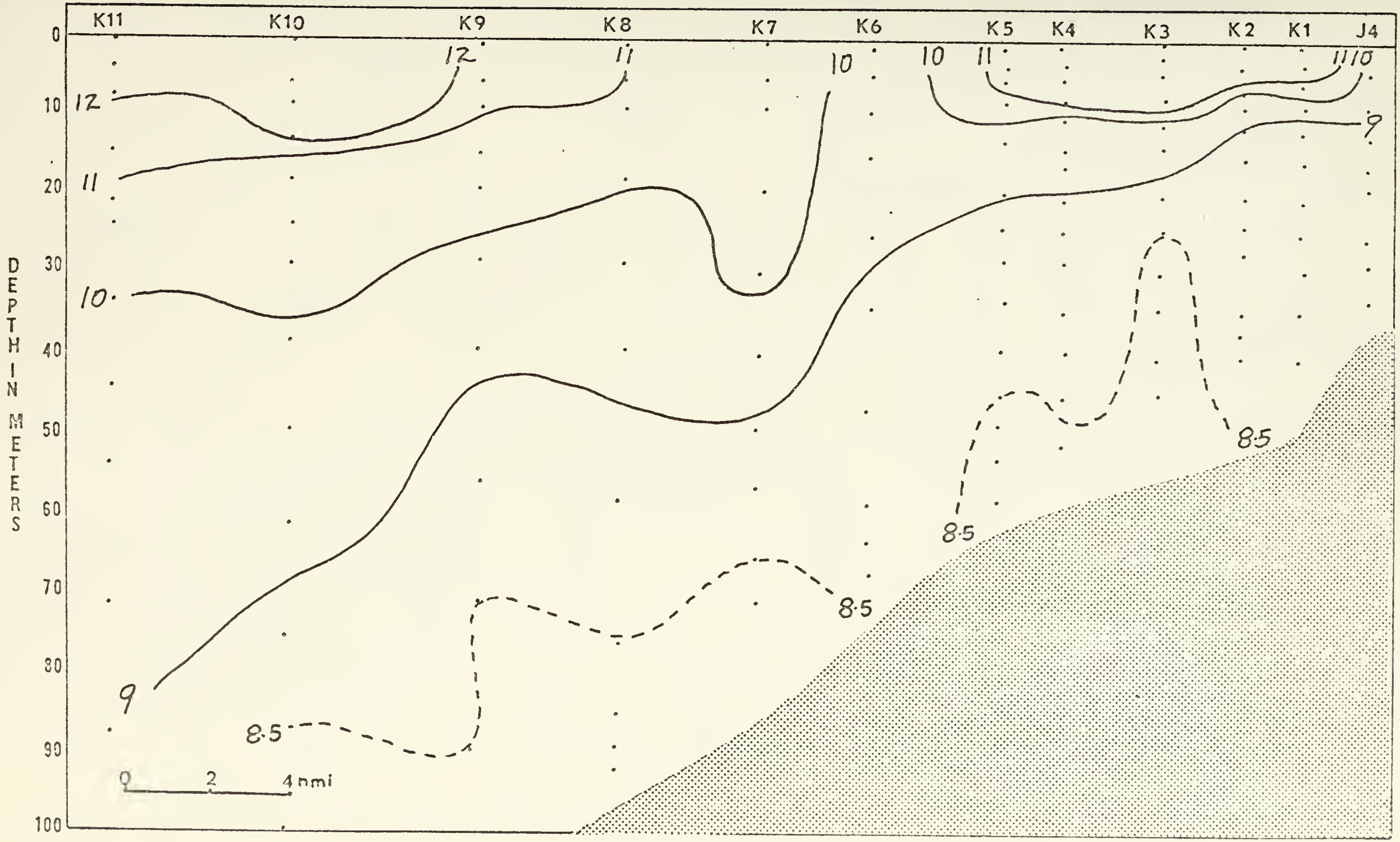


FIGURE 74. Profile of Temperature (^{o}C)

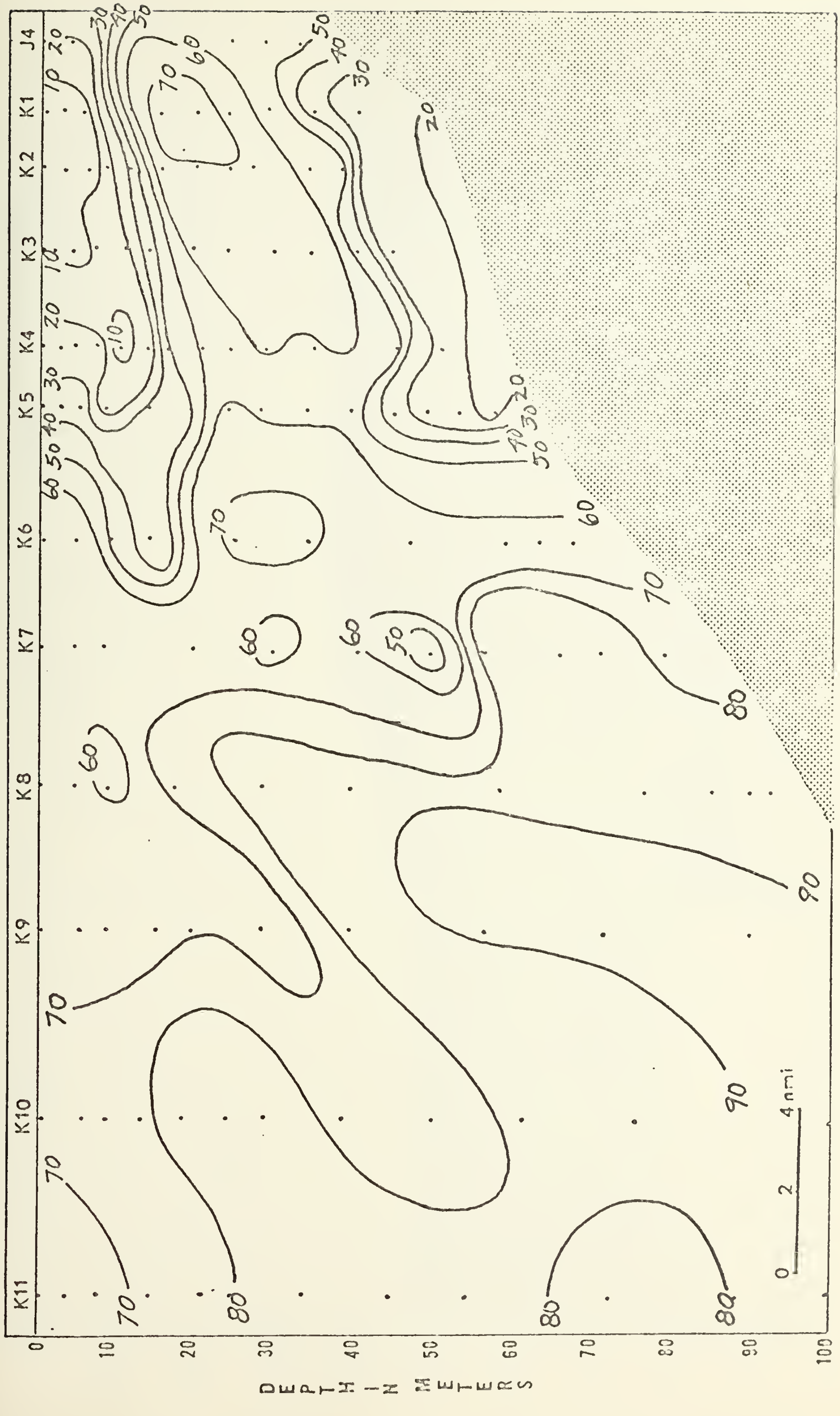


FIGURE 75. Profile of Beam Transmittance (%/m)

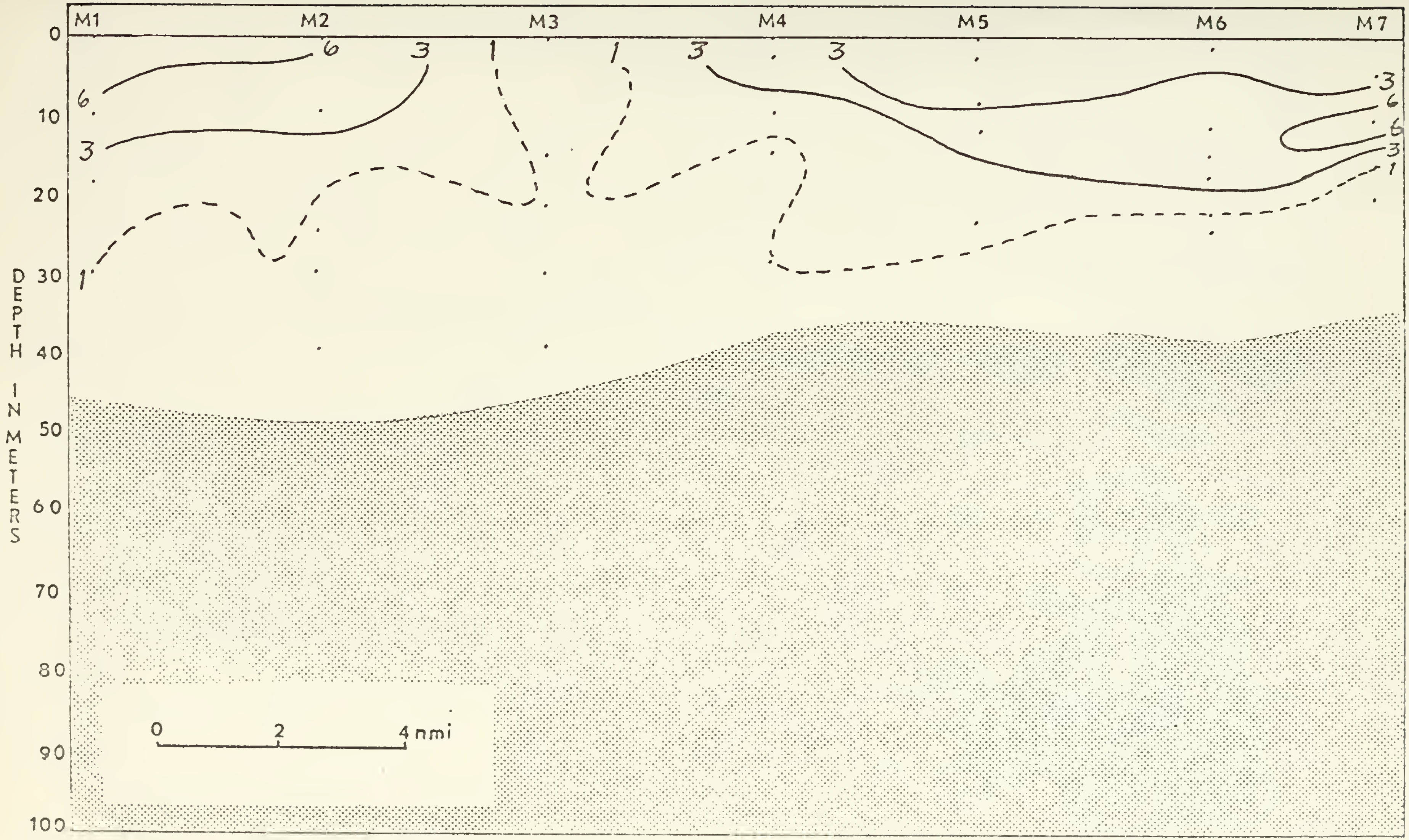


FIGURE 76. Profile of Chlorophyll a (mg/m^3)

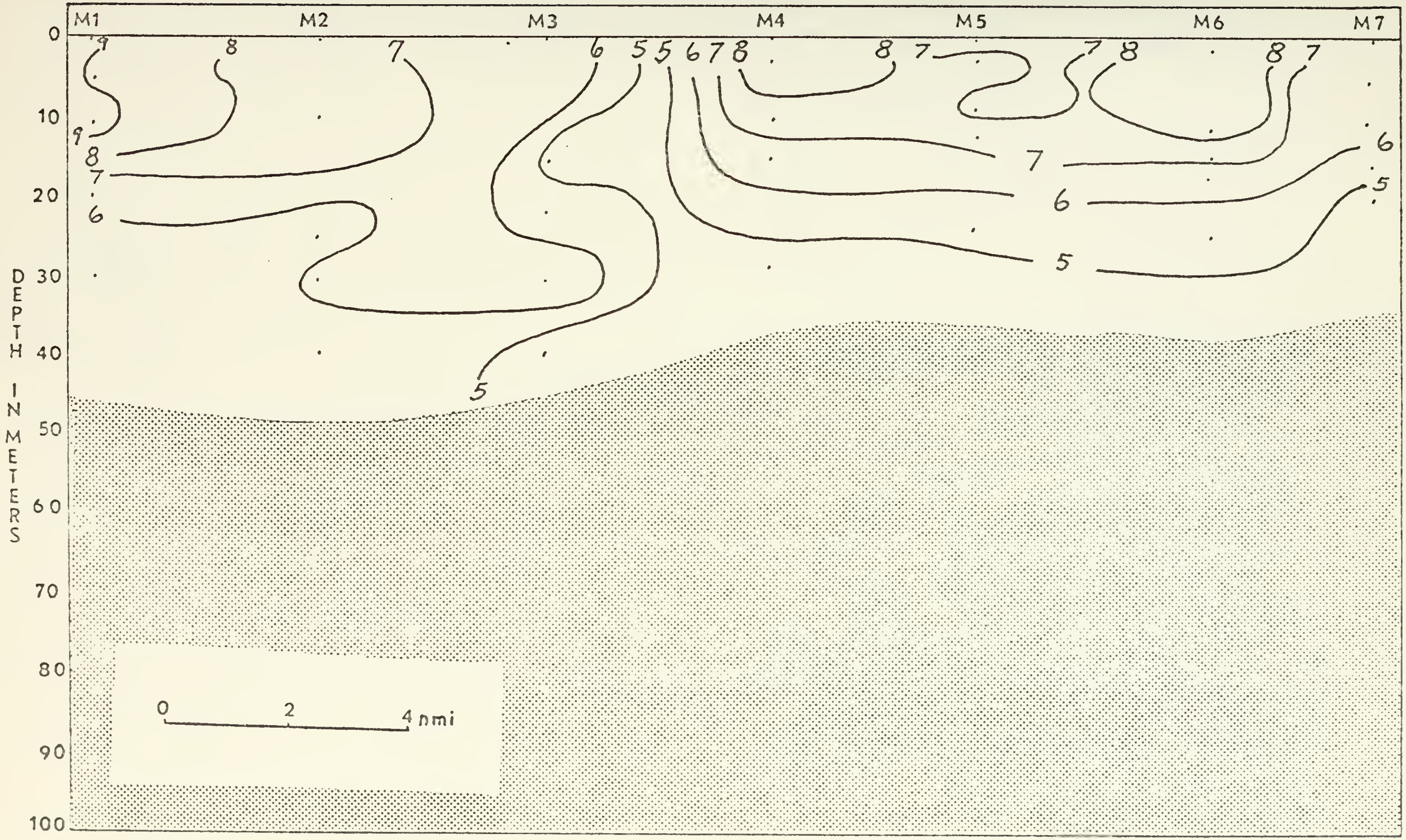


FIGURE 77. Profile of Oxygen (ml/l)

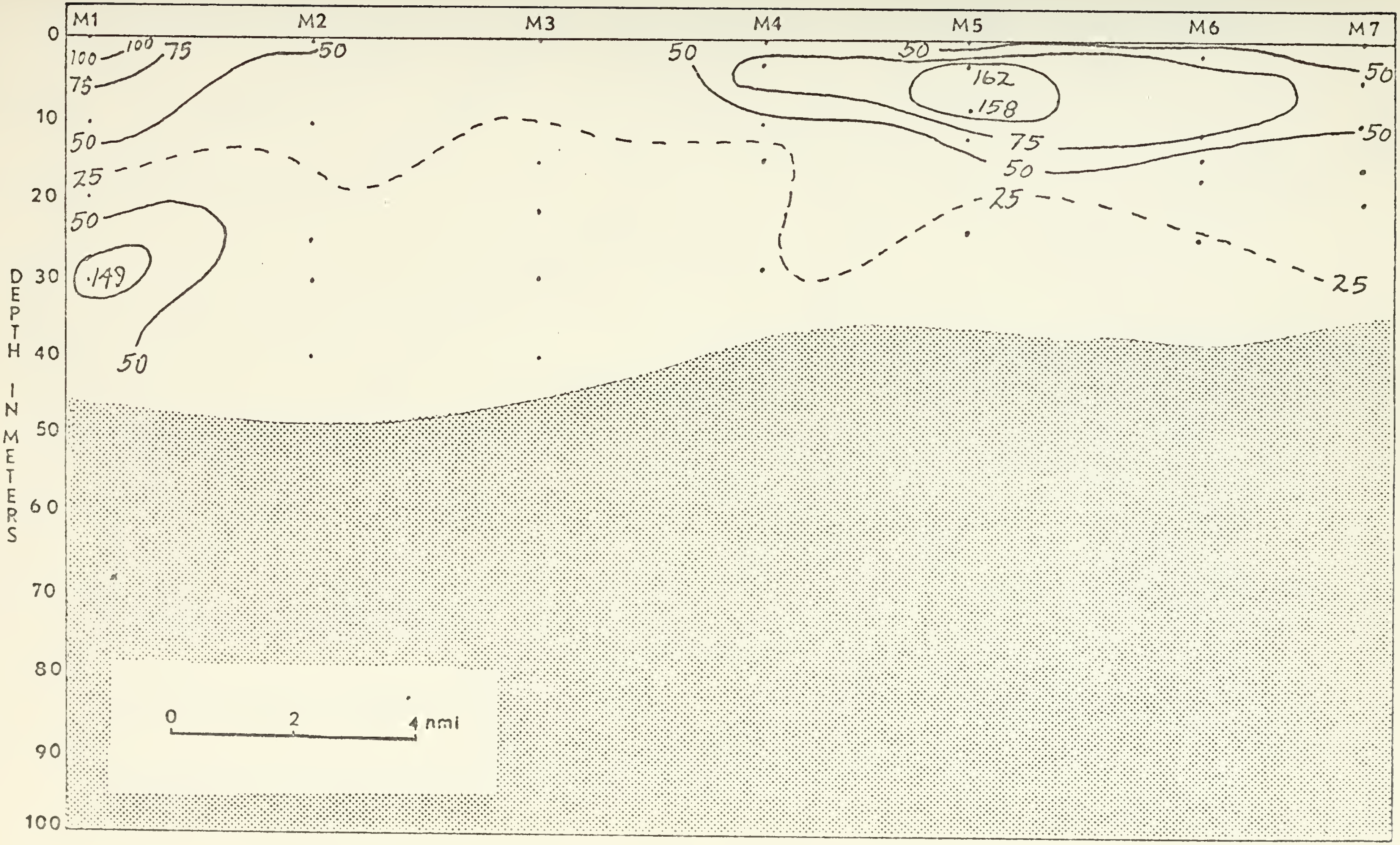


FIGURE 78. Profile of Total Coulter Count (x 10^{-3})

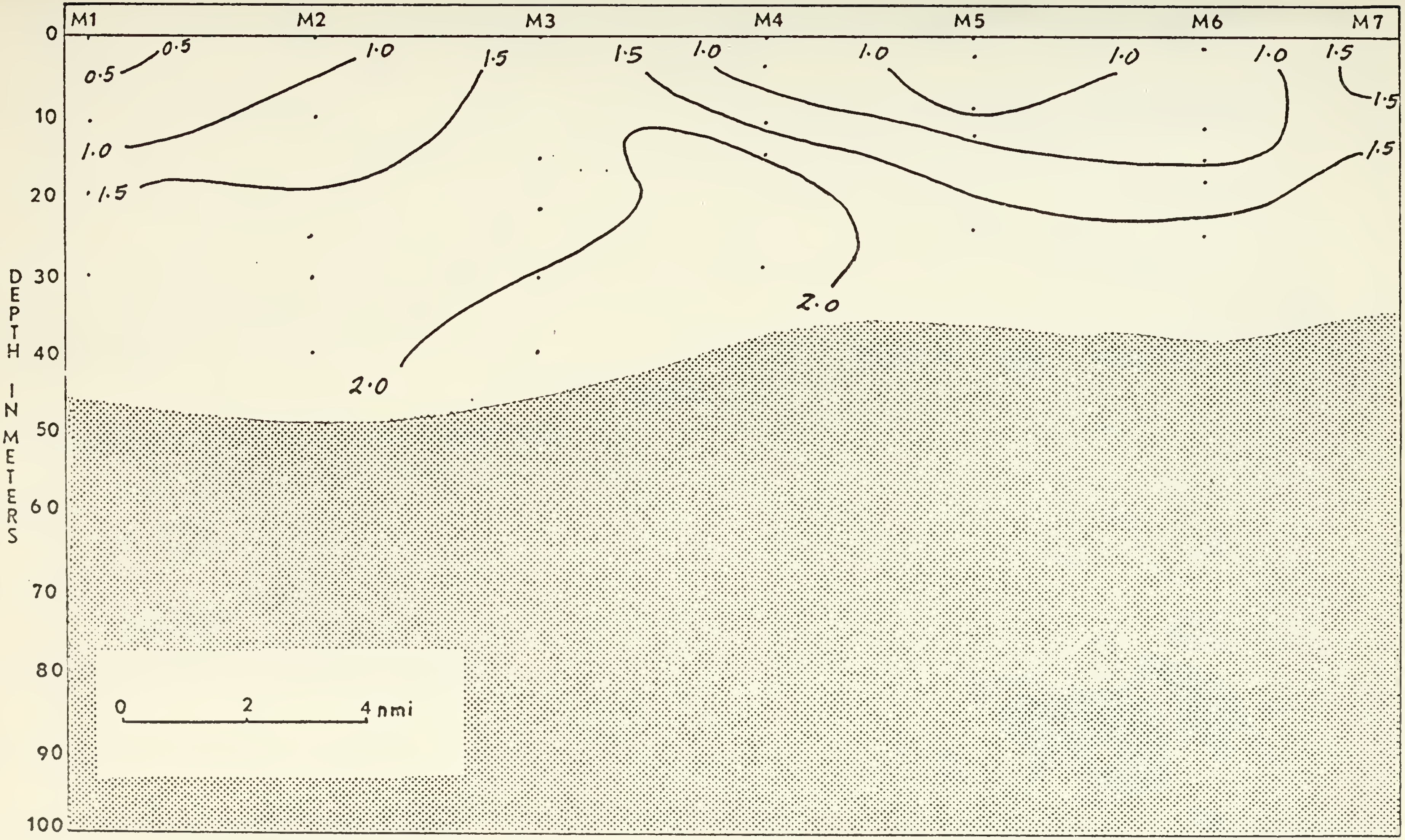


FIGURE 79. Profile of Phosphate (μg-at/l)

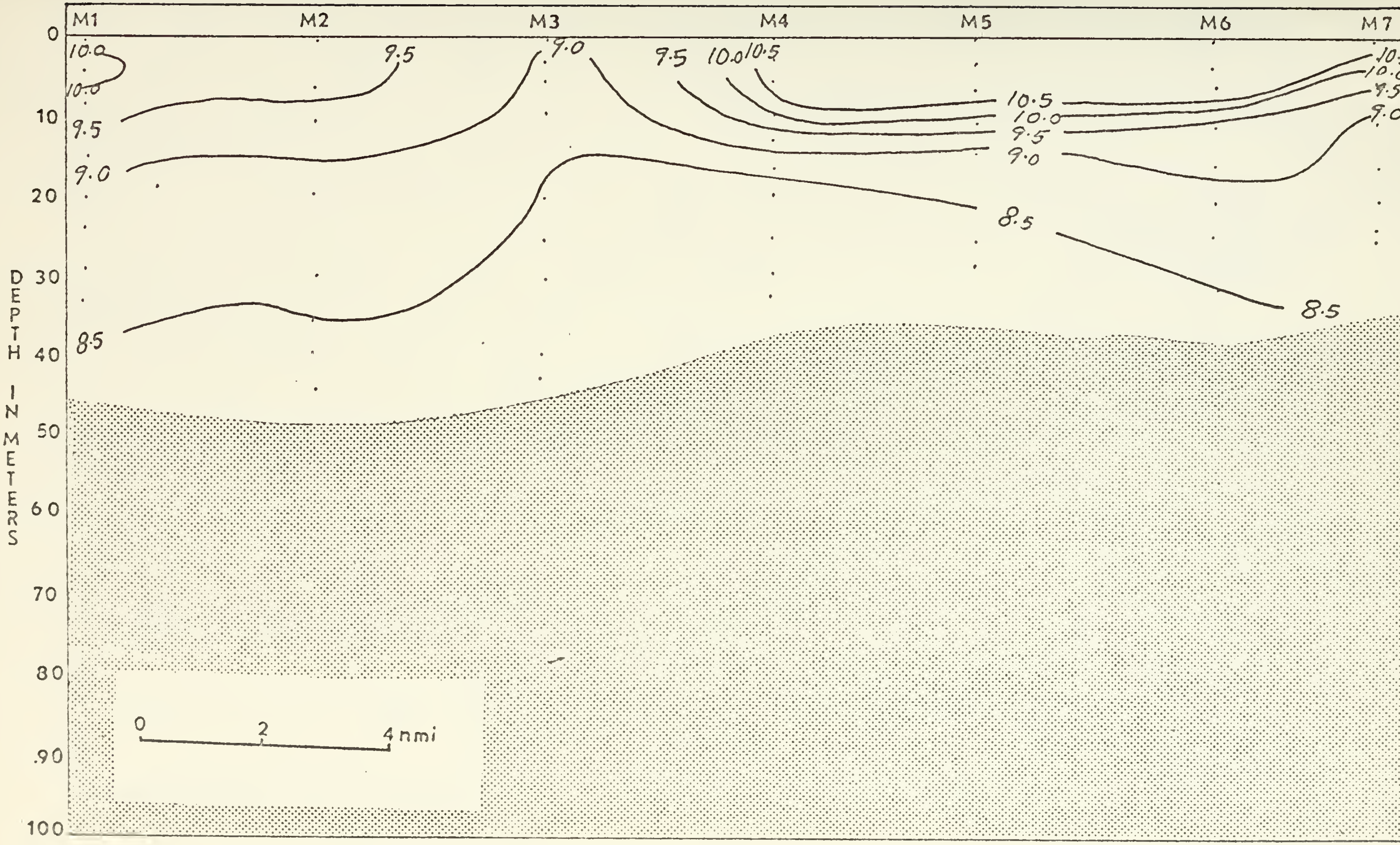


FIGURE 80. Profile of Temperature (^{o}C)

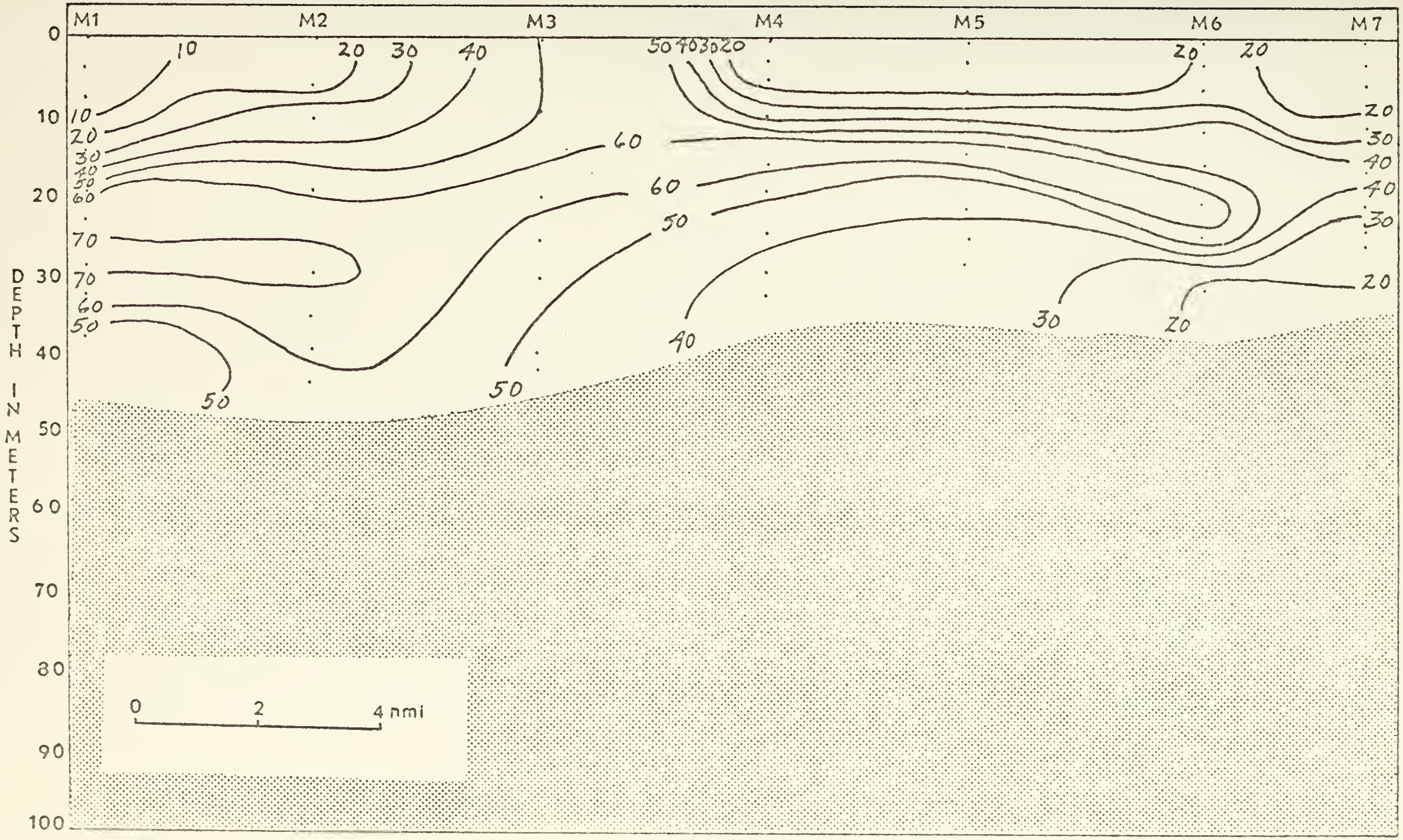


FIGURE 81. Profile of Beam Transmittance (%/m)

TABLE I

Station Data: Location, Time, Depth, Weather, Sound Velocity, Temperature, Transmittance, Oxygen Chlorophyll, and Phosphate

STATION: A-1	DEPTH: 92m	DATE: 4-29-70	TIME: 1130 PST
LAT: 36^{o}-39.9'N	LONG: 121^{o}-54.9'W	WIND: 330^{o}	SPEED: 9
AIR TEMP(DRY): 58^{o}	BARO: 30.14	CLOUD AMT:clear	HEIGHT(FT): --
SEA: 330^{o}	SWELL: 310^{o}-8		

Z	SV	T	TRANS	Z	O_2	Chloro-phyll	PO_4	S	σ_t
m	m/sec	^{o}C	%/m	m	ml/l	mg/m^3	µgAt/l	‰	
	NO DATA			0	8.35	2.34	NO DATA		
				2	8.42	3.18			
				5	7.53	3.78			
				10	4.93	1.17			
				15	3.95	0.98			
				20	2.87	0.41			
				30	2.82	0.33			
				60	2.91	0.77			

STATION: A-2	DEPTH: 97m	DATE: 4-29-70	TIME: 1130 PST
LAT: 36^{o}-40.5'N	LONG: 121^{o}-53.7'W	WIND: --	SPEED: --
AIR TEMP(DRY): 69^{o}	BARO: 30.15	CLOUD AMT: 1	HEIGHT(FT): 500
SEA: --	SWELL: 300^{o}-8		

Z	SV	T	TRANS	Z	O_2	Chloro-phyll	PO_4	S	σ_t
m	m/sec	^{o}C	%/m	m	ml/l	mg/m^3	µgAt/l	‰	
0	1493.2	11.64	9.6	0	8.18	4.98	NO DATA		
3	1493.1	11.58	10.1	5	8.20	3.53			
5	1493.1	11.58	10.3	10	8.27	2.11			
7	1491.3	10.81	10.9	20	6.49	2.39			
10	1490.0	10.61	14.5	35	2.74	0.89			
15	1489.6	10.52	20.0	50	2.84	0.62			
20	1488.2	9.87	35.0						
25	1485.6	9.24	64.3						
34	1484.7	9.03	68.5						
44	1484.4	8.89	65.8						
59	1484.2	8.76	67.0						
75	1484.0	8.65	50.0						

STATION: A-3	DEPTH: 88m	DATE: 4-29-70	TIME: 1500 PST
LAT: 36°-42.2'N	LONG: 121°-54.7'W	WIND: --	SPEED: --
AIR TEMP(DRY): 61°	BARO: 30.17	CLOUD AMT: 1	HEIGHT(FT): 2500
SEA: --	SWELL: 310°-8		

Z m	SV m/sec	T °C	TRANS %/m	Z m	O_2 ml/l	Chlorophyll mg/m^3	PO_4 µgAt/l	S ‰	σ_t
0	--	--	16.9	0	7.23	7.36	0.71		
3	1490.1	10.71	17.1	5	7.07	6.15	0.73		
7	1490.0	10.65	16.4	10	7.19	5.28	0.73		
11	1489.4	10.51	19.3	20	5.72	3.61	1.17		
17	1488.2	10.12	37.0	35	2.81	0.26	2.06		
20	1487.4	9.88	43.2	50	2.65	0.34	2.13		
26	1486.2	9.43	60.0	60	2.43	0.38	2.19		
34	1485.1	9.15	64.0	75	2.80	2.38	2.18		
50	1484.4	8.85	57.6						
60	1484.0	8.68	52.4						
74	1483.6	8.54	63.1						

STATION: A-4	DEPTH: 86m	DATE: 4-29-70	TIME: 1615 PST
LAT: 36°-43.8'N	LONG: 121°-54.6'W	WIND: 250°	SPEED: 13
AIR TEMP(DRY): 54°	BARO: 30.18	CLOUD AMT: 2	HEIGHT(FT): 3000
SEA: 250°-1	SWELL: 310°-8		

Z m	SV m/sec	T °C	TRANS %/m	Z m	O_2 ml/l	Chlorophyll mg/m^3	PO_4 µgAt/l	S ‰	σ_t
0	--	--	28.1	0	5.32	2.07	1.28		
2	1487.8	10.00	27.7	5	6.00	1.84	1.28		
7	1487.9	10.02	27.5	10	--	1.16	1.32		
11	1487.0	9.76	38.7	15	5.16	1.79	1.41		
17	1486.7	9.65	41.6	25	5.03	1.64	1.42		
23	1486.8	9.64	42.0	40	4.85	2.24	1.51		
32	1486.9	9.59	43.7	55	2.41	0.40	2.11		
47	1486.8	8.95	66.4	70	3.20	1.14	2.07		
56	1484.6	8.83	67.4						
70	1484.3	8.71	65.6						

STATION: A-5	DEPTH: 95m	DATE: 4-29-70	TIME: 1800 PST
LAT: 36°-45.0'N	LONG: 121°-54.3'W	WIND: 280°	SPEED: 16
AIR TEMP(DRY): 55°	BARO: 30.12	CLOUD AMT: 6	HEIGHT(FT): 1500
SEA: 280°-4	SWELL: 290°-8		

Z m	SV m/sec	T °C	TRANS %/m	Z m	O_2 ml/l	Chlorophyll mg/m^3	PO_4 µgAt/l	S ‰	σ_t
0	1489.3	10.49	13.5	0	6.62	3.50	1.00		
5	1489.3	10.48	14.7	5	6.62	2.24	1.01		
10	1488.8	10.28	16.0	10	5.99	1.06	1.22		
15	1487.3	9.88	33.3	20	4.82	1.57	1.51		
19	1486.9	9.72	41.2	30	3.60	0.85	1.77		
25	1486.7	9.64	43.7	35	2.88	0.44	1.92		
29	1486.6	9.61	45.2	50	2.42	0.49	2.07		
38	1485.2	9.17	65.6	70	2.15	0.30	2.22		
49	1484.4	8.87	55.4						
68	1483.3	8.50	34.1						
79	1483.2	8.40	60.5						

STATION: A-6	DEPTH: 463m	DATE: 4-29-70	TIME:1945 PST
LAT: 36°-46.5'N	LONG: 121°-54.3'W	WIND: 310°	SPEED: 15
AIR TEMP(DRY): 51°	BARO: 30.13	CLOUD AMT: 6	HEIGHT(FT): 1500
SEA: 290°-4	SWELL: 290°-8		

Z m	SV m/sec	T °C	TRANS %/m	Z m	O_2 ml/l	Chlorophyll mg/m^3	PO_4 µgAt/l	S ‰	σ_t
0	1488.5	10.28	16.7	0	6.16	1.66	1.01		
2	1488.6	10.29	16.7	10	6.34	5.93	1.03		
5	1488.5	10.28	16.6	25	4.88	1.63	1.07		
9	1488.6	10.27	16.6	35	2.62	0.31	2.03		
15	1488.7	10.25	17.3	60	2.12	0.19	2.12		
19	1487.9	9.91	25.5	80	1.97	0.15	2.15		
25	1486.4	9.74	42.5	100	1.98	0.12	2.24		
39	1483.8	8.75	71.7						
58	1483.4	8.56	68.9						
76	1483.5	8.50	75.3						
95	1483.5	8.40	74.7						

STATION: A-7	DEPTH: 91m	DATE: 4-29-70	TIME: 2200
LAT: 36°-47.5'N	LONG: 121°-54.3'W	WIND: 085°	SPEED: 5
AIR TEMP(DRY): 51°	BARO: 30.17	CLOUD AMT: clear	HEIGHT(FT): --
SEA: 085°-1	SWELL: 315°-6		

Z m	SV m/sec	T °C	TRANS %/m	Z m	O_2 ml/l	Chloro-phyll mg/m^3	PO_4 µgAt/l	S ‰	σ_t
0	1488.7	10.31	13.9	0	6.28	4.14	0.97		
2	1488.7	10.31	14.1	5	6.30	3.30	1.02		
5	1488.8	10.32	15.0	12	6.22	0.81	1.02		
11	1487.8	10.03	24.0	25	4.50	3.46	1.52		
15	1487.1	9.87	23.2	35	3.49	0.58	1.48		
26	1485.9	9.44	48.9	50	2.87	0.34	2.00		
35	1484.4	8.94	68.7	65	2.36	0.21	2.04		
50	1483.8	8.70	81.0						
73	1483.4	8.48	64.0						

STATION: A-8	DEPTH: 75m	DATE: 4-29-70	TIME: 2330
LAT: 36°-49.8'W	LONG: 121°-54.5'W	WIND: 030°	SPEED: 5
AIR TEMP(DRY): 51°	BARO: 30.18	CLOUD AMT: clear	HEIGHT(FT): --
SEA: 030°-1	SWELL: 315°-5		

Z m	SV m/sec	T °C	TRANS %/m	Z m	O_2 ml/l	Chloro-phyll mg/m^3	PO_4 µgAt/l	S ‰	σ_t
0	1489.8	10.62	17.3	0	6.74	2.51	0.73		
2	1489.8	10.62	18.7	5	6.82	3.92	0.73		
9	1489.8	10.58	18.7	10	6.80	2.41	0.78		
14	1489.6	10.49	20.0	25	4.94	2.07	1.49		
23	1487.1	9.79	35.6	30	3.30	0.65	1.86		
34	1484.5	8.99	69.6	45	2.36	0.28	2.19		
53	1483.3	8.55	53.0						
63	1483.0	8.41	41.8						

STATION: A-9	DEPTH: 53m	DATE: 4-30-70	TIME: 0100
LAT: 36°-51.4'N	LONG: 121°-54.3'W	WIND: 005°	SPEED: 5
AIR TEMP(DRY): 49°	BARO: 30.17	CLOUD AMT: clear	HEIGHT(FT): --
SEA: 005°-1	SWELL: 315°-5		

Z	SV	T	TRANS	Z	O_2	Chloro-phyll	PO_4	S	σ_t
m	m/sec	°C	%/m	m	ml/l	mg/m^3	µgAt/l	‰	
0	--	--	10.0	0	7.22	4.37	0.26		
2	1491.4	11.08	10.0	5	6.77	6.43	0.32		
5	1491.5	11.11	10.1	10	7.13	6.68	0.45		
10	1491.3	11.03	10.9	20	4.54	0.48	1.48		
16	1490.5	10.80	22.4	30	2.47	0.45	2.04		
20	1488.5	10.20	31.3	40	2.26	0.35	2.10		
25	1485.2	9.29	63.8						
31	1484.3	8.98	73.4						
37	1483.9	8.81	69.6						
41	1483.6	8.70	69.7						

STATION: A-10	DEPTH: 29m	DATE: 4-30-70	TIME: 0200
LAT: 36°-52.9'N	LONG: 121°-54.1'W	WIND: 340°	SPEED: 4
AIR TEMP(DRY): 48°	BARO: 30.16	CLOUD AMT: clear	HEIGHT(FT): --
SEA: 340°-4	SWELL: 315°-5		

Z	SV	T	TRANS	Z	O_2	Chloro-phyll	PO_4	S	σ_t
m	m/sec	°C	%/m	m	ml/l	mg/m^3	µgAt/l	‰	
0	1492.1	11.31	5.7	0	7.14	3.70	0.25		
3	1492.3	11.33	5.9	9	6.73	6.93	0.47		
6	1492.3	11.33	5.7	19	4.38	0.78	1.48		
8	1492.0	11.26	6.8	21	3.13	0.35	2.07		
11	1491.9	11.18	8.0						
14	1491.6	11.11	9.6						
17	1490.4	10.72	42.6						
20	1487.9	10.08	18.4						
24	1485.1	9.15	23.4						
26	1484.6	9.06	55.4						

STATION: A-11	DEPTH: 24m	DATE: 4-30-70	TIME: 0320
LAT: 36°-54.1'N	LONG: 121°-54.4'W	WIND: 350°	SPEED: 4
AIR TEMP(DRY): 49°	BARO: 30.15	CLOUD AMT: clear	HEIGHT(FT): --
SEA: 350°-1	SWELL: 315°-5		

Z m	SV m/sec	T °C	TRANS %/m	Z m	O_2 ml/l	Chlorophyll mg/m^3	PO_4 µgAt/l	S ‰	σ_t
0	1491.2	11.07	8.1	0	6.51	1.83	0.31		
5	1491.5	11.10	7.8	5	7.07	8.60	0.28		
9	1491.5	11.08	8.9	10	7.08	9.67	0.35		
15	1490.8	10.86	13.2	15	6.79	2.20	0.51		
17	1490.0	10.64	19.0	17	6.28	2.38	0.75		
19	1487.9	10.01	14.9						
21	1486.3	9.57	13.2						

STATION: A-12	DEPTH: 18m	DATE: 4-30-70	TIME: 0430
LAT: 36°-55.7'N	LONG: 121°-54.4'W	WIND: 000°	SPEED: 3
AIR TEMP(DRY): 50°	BARO: 30.14	CLOUD AMT: clear	HEIGHT(FT): --
SEA: 000°-1	SWELL: 315°-5		

Z m	SV m/sec	T °C	TRANS %/m	Z m	O_2 ml/l	Chlorophyll mg/m^3	PO_4 µgAt/l	S ‰	σ_t
0	1491.1	11.02	7.1	0	7.25	1.37	0.29		
3	1491.3	11.04	8.1	3	7.17	1.05	0.33		
6	1491.2	11.03	8.3	6	7.11	0.44	0.33		
9	1491.2	11.01	8.3	9	7.18	1.33	0.37		
12	1490.9	10.93	9.5	12	7.24	2.34	0.37		
15	1489.7	10.57	11.6						

STATION: B-1	DEPTH: 16m	DATE: 4-30-70	TIME: 0600
LAT: 36°-56.2'N	LONG: 121°-59.3'W	WIND: --	SPEED: --
AIR TEMP(DRY): 48°	BARO: 30.15	CLOUD AMT: 10	HEIGHT(FT): 800
SEA: --	SWELL: 270°-4		

Z m	SV m/sec	T °C	TRANS %/m	Z m	O_2 ml/l	Chlorophyll mg/m^3	PO_4 µgAt/l	S ‰	σ_t
0	1490.3	10.82	6.5	0	7.06	7.37	0.50		
3	1490.1	10.73	7.2	3	6.88	7.64	0.56		
6	1490.0	10.68	8.1	9	6.56	7.58	0.71		
9	1489.9	10.63	8.8						
12	1489.7	10.57	9.0						

STATION: B-2	DEPTH: 29m	DATE: 4-30-70	TIME: 0700
LAT: 36°-54.8'N	LONG: 121°-59.1'W	WIND: --	SPEED: --
AIR TEMP(DRY): 49°	BARO: 30.15	CLOUD AMT: 10	HEIGHT(FT): 100
SEA: --	SWELL: 270°-4		

Z m	SV m/sec	T °C	TRANS %/m	Z m	O_2 ml/l	Chlorophyll mg/m^3	PO_4 µgAt/l	S ‰	σ_t
0	1489.4	10.53	12.9	0	6.96	5.53	0.51		
2	1489.4	10.54	12.1	5	6.84	3.83	0.55		
5	1489.5	10.54	12.2	10	6.96	8.40	0.56		
10	1489.2	10.42	14.6	15	6.05	6.83	0.91		
15	1487.8	10.01	17.7	20	2.67	1.58	2.15		
21	1485.6	9.51	13.8						
24	1484.4	9.02	9.5						

STATION: B-3	DEPTH: 34m	DATE: 4-30-70	TIME: 0745
LAT: 36°-53.5'N	LONG: 121°-59.4'W	WIND: --	SPEED: --
AIR TEMP(DRY): 48°	BARO: 30.15	CLOUD AMT: 10	HEIGHT(FT): 800
SEA: --	SWELL: 270°-4		

Z m	SV m/sec	T °C	TRANS %/m	Z m	O_2 ml/l	Chloro-phyll mg/m^3	PO_4 µgAt/l	S ‰	σ_t
1	1488.7	10.27	14.9	0	6.33	4.37	0.78		
6	1488.6	10.26	15.6	5	6.26	6.16	0.87		
10	1487.3	9.85	21.7	10	4.82	3.11	1.52		
17	1487.3	9.80	20.1	20	5.17	4.87	1.34		
21	1487.3	9.78	20.1						
26	1486.7	9.60	20.1						
30	1484.8	9.09	18.6						

STATION: B-4	DEPTH: 72m	DATE: 4-30-70	TIME: 0830
LAT: 36°-51.8'N	LONG: 121°-59.1'W	WIND: --	SPEED: --
AIR TEMP(DRY): 49°	BARO: 30.15	CLOUD AMT: 10	HEIGHT(FT): 100
SEA: --	SWELL: 270°-4		

Z m	SV m/sec	T °C	TRANS %/m	Z m	O_2 ml/l	Chloro-phyll mg/m^3	PO_4 µgAt/l	S ‰	σ_t
0	1487.4	9.91	26.0	0	5.92	3.90	0.80		
5	1486.9	9.80	29.2	20	4.50	1.33	1.64		
10	1486.9	9.78	30.7	30	2.47	1.53	1.79		
20	1486.4	9.56	36.9	40	2.61	0.45	2.13		
30	1486.2	9.47	31.7	50	2.23	0.45	2.23		
40	1484.0	8.82	36.4	60	2.34	0.27	2.25		
50	1484.0	8.75	20.0						
60	1483.3	8.52	32.3						
65	1483.4	8.49	38.8						

STATION: B-5	DEPTH: 73m	DATE: 4-30-70	TIME: 1000
LAT: 36°-50.4'N	LONG: 121°-58.8'W	WIND: --	SPEED: --
AIR TEMP(DRY): 54°	BARO: 30.17	CLOUD AMT: 10	HEIGHT(FT): 100
SEA: --	SWELL: 270°-4		

Z	SV	T	TRANS	Z	O_2	Chlorophyll	PO_4	S	σ_t
m	m/sec	°C	%/m	m	ml/l	mg/m^3	µgAt/l	‰	
0		N	38.6	0	4.83	1.18	1.59		
5		O	37.8	10	3.22	0.79	1.98		
10			42.7	25	2.47	0.39	2.25		
21			44.2	40	2.40	0.31	2.22		
31		D	47.8	50	2.38	0.29	2.23		
42		A	53.7	60	2.01	0.19	2.21		
51		T	23.8	80	2.15	0.19	2.24		
61		A	27.4						
66			31.5						

STATION: B-6	DEPTH: 275m	DATE: 4-30-70	TIME: 1100
LAT: 36°-48.9'N	LONG: 121°-58.8'W	WIND: --	SPEED: --
AIR TEMP(DRY): 55°	BARO: 30.18	CLOUD AMT: 10	HEIGHT(FT): 100
SEA: --	SWELL: 270°-4		

Z	SV	T	TRANS	Z	O_2	Chlorophyll	PO_4	S	σ_t
m	m/sec	°C	%/m	m	ml/l	mg/m^3	µgAt/l	‰	
0		N	31.7	0	4.54	2.03	1.34		
5		O	31.7	10	5.56	2.65	1.45		
10			31.1	25	2.33	0.31	2.38		
19			39.8	40	1.98	0.22	2.45		
30		D	45.2	60	2.25	0.20	2.50		
40		A	62.2	80	2.41	0.18	2.51		
60		T	59.5						
80		A	68.3						
100			67.1						

STATION: B-7	DEPTH: 600m	DATE: 4-30-70	TIME: 1245
LAT: 36°-47.1'N	LONG: 121°-58.4'W	WIND: --	SPEED: --
AIR TEMP(DRY): 55°	BARO: 30.18	CLOUD AMT: 10	HEIGHT(FT): 100
SEA: --	SWELL: 270°-4		

Z m	SV m/sec	T °C	TRANS %/m	Z m	O_2 ml/l	Chlorophyll mg/m^3	PO_4 μgAt/l	S ‰	σ_t
0	1487.5	9.93	27.7	0	6.24	2.13	1.46		
3	1487.5	9.86	27.4	6	6.48	1.89	1.49		
6	1486.7	9.73	27.8	18	5.49	3.38	1.64		
10	1486.4	9.63	29.5	30	5.19	1.91	1.77		
14	1486.5	9.61	32.5	40	4.35	0.86	1.95		
18	1486.5	9.60	32.8	60	2.74	0.26	2.19		
22	1486.5	9.59	33.1	75	2.60	0.18	2.28		
31	1485.7	9.37	48.4	95	2.12	0.21	2.35		
40	1485.2	9.12	57.1						
50	1484.4	8.86	64.6						
60	1483.8	8.63	73.8						
76	1484.1	8.63	77.2						
93	1484.0	8.52	68.4						

STATION: B-8	DEPTH: 558m	DATE: 4-30-70	TIME: 1500
LAT: 36°-45.3'N	LONG: 121°-58.7'W	WIND: 270°	SPEED: 16
AIR TEMP(DRY): 55°	BARO: 30.13	CLOUD AMT: clear	HEIGHT(FT):
SEA: 270°-3	SWELL: 300°-7		

Z m	SV m/sec	T °C	TRANS %/m	Z m	O_2 ml/l	Chlorophyll mg/m^3	PO_4 μgAt/l	S ‰	σ_t
0	1487.8	10.03	29.7	0	6.46	2.92	1.43		
5	1487.3	10.05	26.4	5	6.29	2.62	1.42		
10	1486.3	9.60	30.5	15	5.44	2.68	1.78		
16	1486.4	9.59	35.2	30	5.21	2.30	1.67		
19	1494.4	9.61	38.5	40	4.44	0.70	1.88		
29	1485.8	9.38	50.8	55	2.92	0.24	2.17		
39	1484.7	9.00	66.2	75	2.46	0.21	2.40		
58	1484.1	8.76	72.0	100	1.91	0.23	2.18		
69	1484.3	8.73	82.1						
75	1484.4	8.70	83.8						
82	1483.9	8.57	73.7						

STATION: B-9	DEPTH: 366m	DATE: 4-30-70	TIME: 1645
LAT: 36°-44.3'N	LONG: 121°-59.1'W	WIND: 270°	SPEED: 18
AIR TEMP(DRY): 56°	BARO: 30.12	CLOUD AMT: clear	HEIGHT(FT): --
SEA: 270°-4	SWELL: 300°-8		

Z	SV	T	TRANS
m	m/sec	°C	%/m
0	--	--	27.4
5	1487.4	9.93	27.1
11	1487.2	9.87	28.3
14	1486.7	9.71	31.1
20	1486.3	9.54	40.7
30	1486.3	9.48	46.9
40	1485.1	9.13	64.0
59	1484.5	8.84	70.0
80	1483.9	8.58	61.8
96	1483.7	8.42	63.0

Z	O_2	Chloro-phyll	PO_4	S	σ_t
m	ml/l	mg/m^3	µgAt/l	‰	
0	6.63	2.46	1.33		
5	6.61	2.57	1.38		
10	6.47	2.74	1.35		
20	6.14	2.90	1.45		
30	5.46	1.98	1.53		
50	3.04	0.22	2.17		
80	2.06	0.24	2.36		
100	2.25	0.16	2.41		

STATION: B-10	DEPTH: 480m	DATE: 4-30-70	TIME: 1900
LAT: 36°-42.6'N	LONG: 121°-59.4'W	WIND: 305°	SPEED: 15
AIR TEMP(DRY): 54°	BARO: 30.07	CLOUD AMT: clear	HEIGHT(FT): --
SEA: 305°-3	SWELL: 300°-8		

Z	SV	T	TRANS
m	m/sec	°C	%/m
0	1487.9	10.09	22.3
5	1490.0	10.08	22.5
10	1488.1	10.08	22.9
20	1489.4	9.86	31.0
30	1487.3	9.77	40.1
39	1485.5	9.24	66.3
49	1484.4	8.87	65.0
60	1484.0	8.73	63.3
75	1484.1	8.64	69.9
85	1483.9	8.56	78.1
89	1483.8	8.51	82.2
93	1483.7	8.47	80.9
98	1483.7	8.44	80.1

Z	O_2	Chloro-phyll	PO_4	S	σ_t
m	ml/l	mg/m^3	µgAt/l	‰	
0	6.41	4.06	1.37		
20	6.04	5.34	1.40		
40	5.33	2.29	1.74		
60	2.77	0.39	2.33		
80	2.22	0.26	2.34		
100	2.35	0.19	2.43		

STATION: B-11	DEPTH: 108m	DATE: 4-30-70	TIME: 2000
LAT: 36°-41.2'N	LONG: 121°-59.2'W	WIND: 315°	SPEED: 19
AIR TEMP(DRY): 53°	BARO: 30.07	CLOUD AMT: clear	HEIGHT(FT): --
SEA: 315°-4	SWELL: 310°-9		

Z	SV	T	TRANS	Z	O_2	Chloro-phyll	PO_4	S	σ_t
m	m/sec	°C	%/m	m	ml/l	mg/m^3	µgAt/l	‰	
0	1489.1	10.43	20.2	0	6.81	3.03	1.19		
11	1489.2	10.41	20.7	10	6.95	2.87	1.16		
21	1488.4	10.17	26.7	30	3.54	1.96	2.03		
30	1486.4	9.61	66.1	50	2.57	0.49	2.36		
41	1484.6	9.98	68.2	65	2.36	0.26	2.32		
51	1484.2	8.81	69.3	90	2.10	0.32	2.42		
61	1483.9	8.70	73.3						
71	1483.9	8.62	85.6						
81	1484.0	8.60	--						
90	1484.0	8.55	83.6						
100	1483.6	8.40	87.4						

STATION: B-12	DEPTH: 100m	DATE: 4-30-70	TIME: 2115
LAT: 36°-39.4'N	LONG: 121°-59.2'W	WIND: 315°	SPEED: 14
AIR TEMP(DRY): 51°	BARO: 30.12	CLOUD AMT: clear	HEIGHT(FT): --
SEA: 310°-4	SWELL: 310°-8		

Z	SV	T	TRANS	Z	O_2	Chloro-phyll	PO_4	S	σ_t
m	m/sec	°C	%/m	m	ml/l	mg/m^3	µgAt/l	‰	
0	1489.7	10.60	24.2	0	7.75	5.02	0.81		
6	1489.8	10.63	21.6	10	7.45	5.01	0.90		
12	1489.9	10.63	21.5	30	2.95	0.38	2.13		
21	1486.8	9.67	57.5	75	2.94	0.31	2.28		
31	1484.2	8.96	84.7	90	2.16	0.37	2.40		
52	1484.1	8.77	87.3						
71	1484.0	8.69	86.0						
93	1483.8	8.51	76.0						

STATION: B-13	DEPTH: 82m	DATE: 4-30-70	TIME: 2215
LAT: 36°-38.2'N	LONG: 121°-59.1'W	WIND: 315°	SPEED: 10
AIR TEMP(DRY): 50°	BARO: 30.14	CLOUD AMT: clear	HEIGHT(FT): --
SEA: 315°-4	SWELL: 315°-8		

Z m	SV m/sec	T °C	TRANS %/m	Z m	O_2 ml/l	Chlorophyll mg/m^3	PO_4 µgAt/l	S ‰	σ_t
0	1490.5	10.75	14.4	0	7.42	6.08	0.86		
10	1488.6	10.51	37.0	20	3.42	0.68	1.97		
15	1485.4	9.37	68.2	40	3.18	0.47	2.19		
26	1484.3	8.89	76.8						
36	1483.8	8.63	81.4						
39	1483.5	8.60	82.9						
51	1483.4	8.50	82.9						
61	1483.6	8.52	83.8						
66	1483.5	8.49	80.9						

STATION: C-1	DEPTH: 503m	DATE: 4-30-70	TIME: 2350
LAT: 36°-36'N	LONG: 122°-01.6'W	WIND: 315°	SPEED: 6
AIR TEMP(DRY): 50°	BARO: 30.14	CLOUD AMT: clear	HEIGHT(FT): --
SEA: 315°-4	SWELL: 315°-8		

Z m	SV m/sec	T °C	TRANS %/m	Z m	O_2 ml/l	Chlorophyll mg/m^3	PO_4 µgAt/l	S ‰	σ_t
0	1492.4	11.37	5.6	0	9.37	7.74	0.34		
6	1492.5	11.40	5.2	15	5.44	1.79	1.53		
11	1488.8	10.47	28.8	30	4.02	0.43	1.97		
21	1486.3	9.58	62.4	60	3.01	0.25	2.05		
31	1484.8	9.13	70.1	90	3.00	0.20	2.08		
51	1484.6	8.93	87.0						
70	1484.2	8.67	89.1						
91	1483.3	8.38	92.1						

STATION: C-2	DEPTH:1000m	DATE: 5-1-70	TIME: 0145
LAT: 36°-33.6'N	LONG: 122°-04.6'W	WIND: 330°	SPEED: 10
AIR TEMP(DRY): 50°	BARO: 30.12	CLOUD AMT:clear	HEIGHT(FT): --
SEA: 335°-3	SWELL: 320°-8		

Z m	SV m/sec	T °C	TRANS %/m	Z m	O_2 ml/l	Chlorophyll mg/m^3	PO_4 µgAt/l	S ‰	σ_t
0	1491.2	11.04	12.6	0	7.27	4.78	0.46		
3	1491.4	11.07	11.0	3	8.00	5.85	0.47		
8	1491.4	11.07	10.7	8	8.12	6.24	0.49		
13	1489.2	10.43	41.0	12	7.63	5.06	0.62		
16	1487.5	10.00	49.6	25	5.31	2.95	1.65		
20	1487.0	9.77	50.4	55	4.02	0.62	1.94		
26	1487.1	9.76	53.6	75	3.49	0.42	2.30		
37	1486.3	9.48	60.4	100	2.86	0.20	2.08		
46	1486.2	9.42	63.5						
55	1485.4	9.15	70.4						
65	1484.6	8.90	74.2						
77	1484.4	8.77	81.5						
85	1484.5	8.74	83.5						
97	1484.6	8.72	81.4						

STATION: C-3	DEPTH: 1600m	DATE: 5-1-70	TIME: 0315
LAT: 36°-31.3'N	LONG: 122°-07W	WIND: 335°	SPEED: 10
AIR TEMP(DRY): 53°	BARO: 30.09	CLOUD AMT:clear	HEIGHT(FT): --
SEA: 335°-3	SWELL: 320°-8		

Z m	SV m/sec	T °C	TRANS %/m	Z m	O_2 ml/l	Chlorophyll mg/m^3	PO_4 µgAt/l	S ‰	σ_t
0	1487.6	10.07	64.9	0	5.97	0.32	1.41		
5	1487.6	10.06	65.1	15	5.75	0.42	1.46		
10	1487.6	10.00	66.6	30	5.30	1.04	1.17		
15	1487.4	9.92	67.3	50	4.97	1.87	1.78		
20	1486.2	9.58	69.6	90	3.15	0.32	1.97		
30	1485.8	9.38	74.4						
39	1486.4	9.52	65.6						
51	1486.5	9.47	61.8						
69	1485.9	9.23	65.8						
89	1485.1	8.95	76.0						

STATION: D-1	DEPTH: 2300m	DATE: 5-1-70	TIME: 0600
LAT: 36°-35.3'N	LONG: 122°-10.7'W	WIND: --	SPEED: --
AIR TEMP(DRY): 50°	BARO: 30.11	CLOUD AMT: clear	HEIGHT(FT): --
SEA: --	SWELL: 300°-4		

Z	SV	T	TRANS
m	m/sec	°C	%/m
0	1488.3	10.39	53.9
4	1488.5	10.39	53.6
8	1488.5	10.38	53.1
16	1488.6	10.37	56.3
26	1488.2	10.21	64.4
35	1488.2	10.19	64.4
44	1486.3	9.56	79.5
55	1485.9	9.38	84.0
66	1485.9	9.30	82.8
77	1485.6	9.17	83.3
86	1485.1	8.97	86.0
97	1484.4	8.74	87.0

Z	O_2	Chlorophyll	PO_4	S	σ_t
m	ml/l	mg/m^3	μgAt/l	‰	
0	6.33	0.72	1.04		
10	6.28	0.96	1.06		
25	6.04	0.80	1.18		
45	5.18	0.53	1.61		
65	4.86	0.32	1.72		
95	3.35	0.18	1.91		

STATION: D-2	DEPTH: 1550m	DATE: 5-1-70	TIME: 0800
LAT: 36°-39.7'N	LONG: 122°-15.2'W	WIND: --	SPEED: --
AIR TEMP(DRY): 50°	BARO: 30.12	CLOUD AMT clear	HEIGHT(FT): --
SEA: --	SWELL: 300°-4		

Z	SV	T	TRANS
m	m/sec	°C	%/m
0	1488.7	10.41	48.5
5	1488.8	10.45	48.5
10	1488.9	10.45	48.6
20	1489.0	10.44	49.4
40	1485.9	9.41	82.8
51	1485.6	9.27	84.4
65	1485.3	9.10	90.0
80	1484.8	8.91	87.0
86	1484.7	8.82	84.2
100	1484.2	8.60	89.7

Z	O_2	Chlorophyll	PO_4	S	σ_t
m	ml/l	mg/m^3	μgAt/l	‰	
0	6.46	0.71	0.94		
20	6.35	1.09	0.99		
35	5.28	0.25	1.45		
60	4.77	0.86	1.75		
100	3.77	0.26	1.98		

STATION: D-3	DEPTH: 1350m	DATE: 5-1-70	TIME: 1000
LAT: 36°-42.7'N	LONG: 122°-18.7'W	WIND: 315°	SPEED: 4
AIR TEMP(DRY): 54°	BARO: 30.14	CLOUD AMT: clear	HEIGHT(FT): --
SEA: 315°-2	SWELL: 315°-6		

Z m	SV m/sec	T °C	TRANS %/m
0	1487.4	9.98	63.0
10	1487.4	9.98	63.1
20	1487.2	9.82	64.0
30	1487.5	9.85	64.0
51	1487.4	9.74	61.9
70	1487.0	9.54	62.0
75	1487.0	9.48	51.0
86	1486.8	9.35	58.2
95	1486.2	9.18	80.6
100	1486.2	9.14	80.6

Z m	O_2 ml/1	Chlorophyll mg/m^3	PO_4 µgAt/1	S ‰	σ_t
0	6.02	0.28	1.36		
40	5.71	0.68	1.46		
65	5.56	1.11	1.52		
80	5.13	1.09	1.67		
100	4.55	0.34	1.83		

STATION: E-1	DEPTH: 750m	DATE: 5-1-70	TIME: 1130
LAT: 36°-47'N	LONG: 122°-14.7'W	WIND: 305°	SPEED: 3
AIR TEMP(DRY): 64°	BARO: 30.14	CLOUD AMT: clear	HEIGHT(FT): --
SEA: 305°-2	SWELL: 315°-8		

Z m	SV m/sec	T °C	TRANS %/m
0	1487.7	10.12	71.7
5	1487.1	9.97	71.2
10	1486.9	9.89	68.0
20	1486.5	9.67	66.0
31	1486.0	9.53	70.0
40	1485.8	9.44	71.7
52	1484.8	9.05	79.6
71	1484.2	8.75	88.6
91	1484.2	8.62	90.4
100	1484.6	8.67	90.0

Z m	O_2 ml/1	Chlorophyll mg/m^3	PO_4 µgAt/1	S ‰	σ_t
0	5.56	0.29	1.35		
25	5.74	1.79	1.45		
50	3.44	0.47	2.08		
75	3.02	0.30	2.10		
100	2.45	0.28	2.30		

STATION: E-2	DEPTH: 510m	DATE: 5-1-70	TIME: 1330
LAT: 36°-50'N	LONG: 122°-10.2'W	WIND: 295°	SPEED: 12
AIR TEMP(DRY): 61°	BARO: 30.16	CLOUD AMT: clear	HEIGHT(FT): --
SEA: 290°-3	SWELL: 315°-7		

Z	SV	T	TRANS	Z	O_2	Chloro-phyll	PO_4	S	σ_t
m	m/sec	°C	%/m	m	ml/l	mg/m^3	µgAt/l	‰	
0	1489.4	10.53	79.1	0	5.65	0.08	1.39		
3	1487.8	10.17	78.5	10	5.66	0.08	1.46		
7	1486.4	9.73	66.7	15	5.96	1.68	1.41		
16	1485.8	9.48	59.0	25	5.92	3.10	1.50		
25	1485.7	9.41	68.6	40	4.83	1.63	1.37		
35	1485.8	9.36	45.3	60	3.95	0.58	--		
45	1485.6	9.27	49.0	80	2.46	0.28	2.29		
54	1485.7	9.26	48.0	95	5.13	1.60	2.01		
62	1485.3	9.08	55.5						
71	1484.9	8.91	60.8						
78	1484.1	8.67	75.0						
85	1483.9	8.55	93.0						

STATION: E-3	DEPTH: 142m	DATE: 5-1-70	TIME: 1500
LAT: 36°-51.6'N	LONG: 122°-09.7'W	WIND: 295°	SPEED: 13
AIR TEMP(DRY): 53°	BARO: 30.17	CLOUD AMT: clear	HEIGHT(FT): --
SEA: 295°-2	SWELL: 310°-6		

Z	SV	T	TRANS	Z	O_2	Chloro-phyll	PO_4	S	σ_t
m	m/sec	°C	%/m	m	ml/l	mg/m^3	µgAt/l	‰	
0	--	--	54.0	0	6.29	1.76	1.37		
3	1488.3	10.25	53.4	10	6.01	2.20	1.48		
8	1486.7	9.77	39.5	25	5.56	3.71	1.75		
12	1485.9	9.50	39.5	35	4.95	1.48	1.92		
16	1485.5	9.37	39.5	55	4.49	2.00	1.95		
26	1485.4	9.30	48.0	75	2.68	0.24	2.28		
35	1485.4	9.24	37.2	95	2.29	0.21	2.40		
44	1485.1	9.11	42.5						
51	1485.1	9.07	44.0						
58	1485.0	9.01	50.0						
67	1484.2	8.74	62.8						
77	1483.7	8.57	87.5						
85	1483.6	8.49	91.0						

STATION: E-4	DEPTH: 95m	DATE: 5-1-70	TIME: 1700
LAT: 36°-53.3'N	LONG: 122°-09.2'W	WIND: 295°	SPEED: 12
AIR TEMP(DRY): 56°	BARO: 30.15	CLOUD AMT: clear	HEIGHT(FT): --
SEA: --	SWELL: 290°-4		

Z m	SV m/sec	T °C	TRANS %/m	Z m	O_2 ml/l	Chlorophyll mg/m^3	PO_4 μgAt/l	S ‰	σ_t
0	1489.0	10.60	26.5	0	6.20	1.83	1.48		
3	1487.5	9.92	27.8	10	5.67	5.34	1.53		
9	1488.3	10.14	26.5	35	3.17	0.45	2.25		
16	1485.2	9.25	32.5	55	3.20	0.48	2.32		
25	1485.2	9.19	31.3	75	1.96	0.36	2.52		
35	1485.0	9.07	35.1						
45	1484.8	8.98	41.8						
54	1484.4	8.86	51.0						
64	1483.8	8.61	57.5						
73	1483.5	8.48	78.0						

STATION: E-5	DEPTH: 76m	DATE: 5-1-70	TIME: 1800
LAT: 36°-54.3'N	LONG: 122°-07.5'W	WIND: 300°	SPEED: 13
AIR TEMP(DRY): 57°	BARO: 30.14	CLOUD AMT: clear	HEIGHT(FT): --
SEA: 300°-1	SWELL: 310°-6		

Z m	SV m/sec	T °C	TRANS %/m	Z m	O_2 ml/l	Chlorophyll mg/m^3	PO_4 μgAt/l	S ‰	σ_t
1	1490.6	10.86	9.7	0	7.14	6.40	1.00		
5	1490.9	10.92	12.1	25	4.17	1.54	1.99		
11	1485.4	9.40	37.7	50	2.82	0.27	2.30		
15	1485.2	9.23	42.2						
20	1484.9	9.17	44.1						
30	1484.7	9.09	49.3						
40	1483.5	8.78	62.7						
50	1483.3	8.59	77.4						
62	1483.3	85.0	61.9						
70	1483.3	8.47	46.1						

STATION: E-6	DEPTH: 52m	DATE: 5-1-70	TIME: 1900
LAT: 36°-55.7'N	LONG: 122°-06.3'W	WIND: 300°	SPEED: 5
AIR TEMP(DRY): 54°	BARO: 30.15	CLOUD AMT: clear	HEIGHT(FT): --
SEA: 300°-1	SWELL: 300°-5		

Z m	SV m/sec	T °C	TRANS %/m
0	1492.7	11.40	5.1
5	1492.8	11.47	5.1
11	1487.1	9.70	31.2
21	1484.7	9.02	43.8
30	1484.7	8.98	45.0
41	1484.5	8.89	45.5
45	1484.1	8.72	45.7

Z m	O_2 ml/l	Chlorophyll mg/m^3	PO_4 μgAt/l	S ‰	σ_t
0	8.16	7.91	0.30		
3	8.37	11.98	0.30		
25	3.86	1.15	2.13		

STATION: E-7	DEPTH: 36m	DATE: 5-1-70	TIME: 2000
LAT: 36°-55.9'N	LONG: 122°-04.8'W	WIND: --	SPEED: --
AIR TEMP(DRY): 51°	BARO: 30.16	CLOUD AMT: clear	HEIGHT(FT): --
SEA: --	SWELL: 280°-4		

Z m	SV m/sec	T °C	TRANS %/m
0	1491.9	11.24	5.7
4	1491.8	11.17	6.5
10	1488.7	10.39	16.2
16	1486.0	9.53	28.5
20	1485.5	9.34	42.5
25	1485.3	9.24	42.5
30	1484.6	9.04	28.8

Z m	O_2 ml/l	Chlorophyll mg/m^3	PO_4 μgAt/l	S ‰	σ_t
0	7.31	9.89	0.49		
10	5.88	8.39	1.17		
20	4.42	1.46	1.99		
30	2.84	0.67	2.36		

STATION: F-1	DEPTH: 44m	DATE: 5-1-70	TIME: 2300
LAT: 36°-57.4'N	LONG: 122°-10'W	WIND: --	SPEED: --
AIR TEMP(DRY): 51°	BARO: 30.20	CLOUD AMT: 10	HEIGHT(FT): 100
SEA: --	SWELL: 290°-5		

Z	SV	T	TRANS	Z	O_2	Chloro-phyll	PO_4	S	σ_t
m	m/sec	°C	%/m	m	ml/l	mg/m^3	µgAt/l	‰	
0		N	7.6	0	7.09	12.35	0.71		
5		O	7.6	10	3.50	8.14	1.10		
10			20.2	20	2.01	1.16	2.02		
15			46.0	30	1.49	0.84	2.28		
20		D	46.0						
25		A	35.1						
30		T	30.4						
35		A	30.0						

STATION: F-2	DEPTH: 42m	DATE: 5-2-70	TIME: 0130
LAT: 37°-00.4'N	LONG: 122°-14.3'W	WIND: --	SPEED: --
AIR TEMP(DRY): 48°	BARO: 30.19	CLOUD AMT: 10	HEIGHT(FT): 100
SEA: --	SWELL: 290°-5		

Z	SV	T	TRANS	Z	O_2	Chloro-phyll	PO_4	S	σ_t
m	m/sec	°C	%/m	m	ml/l	mg/m^3	µgAt/l	‰	
0	1487.3	9.62	21.4	0	6.79	6.58	0.87		
5	1486.7	9.42	25.5	3	7.33	6.53	1.06		
10	1486.5	9.33	26.1	10	6.45	6.27	1.30		
19	1485.1	8.90	28.3	14	6.11	3.60	1.44		
24	1484.5	8.74	19.6	20	4.69	1.23	1.83		
30	1484.0	8.56	20.7	27	4.03	1.39	2.03		
34	1483.4	8.36	25.1	35	3.80	0.87	2.22		

STATION: F-3	DEPTH: 36m	DATE: 5-2-70	TIME: 0300
LAT: 37°-03.8'N	LONG: 122°-17.9'W	WIND: --	SPEED: --
AIR TEMP(DRY): 47°	BARO: 30.18	CLOUD AMT: 10	HEIGHT(FT): 100
SEA: --	SWELL: 290°-5		

Z (m)	SV (m/sec)	T (°C)	TRANS (%/m)	Z (m)	O_2 (ml/l)	Chlorophyll (mg/m^3)	PO_4 (µgAt/l)	S (‰)	σ_t
0	1486.7	9.55	22.5	0	6.52	5.68	1.15		
3	1486.7	9.52	27.5	8	6.19	3.85	1.44		
8	1486.7	9.47	31.0	20	4.85	2.22	1.94		
15	1485.5	9.12	44.5	25	3.85	1.02	2.10		
19	1484.6	8.86	44.5						
25	1483.5	8.53	33.0						

STATION: G-1	DEPTH: 45m	DATE: 5-2-70	TIME: 0445
LAT: 37°-04.2'N	LONG: 122°-19.4'W	WIND: --	SPEED: --
AIR TEMP(DRY): 47°	BARO: 30.18	CLOUD AMT: 10	HEIGHT(FT): 100
SEA: --	SWELL: --		

Z (m)	SV (m/sec)	T (°C)	TRANS (%/m)	Z (m)	O_2 (ml/l)	Chlorophyll (mg/m^3)	PO_4 (µgAt/l)	S (‰)	σ_t
0	1486.5	9.49	23.0	0	4.41	5.66	1.00		
2	1486.4	9.44	23.0	5	4.99	7.18	1.53		
7	1486.2	9.39	30.6	17	5.38	3.74	1.89		
14	1485.6	9.18	43.7	25	4.70	1.38	--		
24	1484.3	8.81	55.8	35	3.59	0.86	2.23		
32	1483.4	8.45	36.0						

STATION: G-2	DEPTH: 72m	DATE: 5-2-70	TIME: 0800
LAT: 37°-02.7'N	LONG: 122°-20.5'W	WIND: --	SPEED: --
AIR TEMP(DRY): 47°	BARO: 30.19	CLOUD AMT: 10	HEIGHT(FT): 100
SEA: --	SWELL: 300°-4		

Z m	SV m/sec	T °C	TRANS %/m
0	1486.3	9.38	36.0
3	1486.4	9.40	37.5
8	1486.4	9.36	37.5
14	1486.1	9.30	37.5
24	1485.6	9.07	38.5
34	1483.6	8.51	76.5
44	1482.6	8.23	73.0
52	1482.3	8.05	69.0
59	1482.3	8.02	61.6

Z m	O_2 ml/l	Chlorophyll mg/m^3	PO_4 µgAt/l	S ‰	σ_t
0	5.78	2.26	1.60		
15	5.32	2.60	1.78		
30	4.99	1.35	1.88		
45	3.80	0.62	2.02		
60	2.44	0.37	2.31		

STATION: G-3	DEPTH: 99m	DATE: 5-2-70	TIME: 1000
LAT: 37°-01.5'N	LONG: 122°-21.8'W	WIND: 315°	SPEED: 8
AIR TEMP(DRY): 51°	BARO: 30.19	CLOUD AMT: 10	HEIGHT(FT): 100
SEA: --	SWELL: 315°-4		

Z m	SV m/sec	T °C	TRANS %/m
0	1486.9	9.56	33.2
5	1486.4	9.37	33.1
9	1486.0	9.29	44.3
17	1485.5	9.09	48.1
27	1483.5	8.49	86.5
37	1483.1	8.36	82.5
52	1483.1	8.26	81.8
66	1482.8	8.12	80.5
75	1482.6	8.01	69.7
83	1482.6	8.00	65.8
93	1482.8	7.99	58.5

Z m	O_2 ml/l	Chlorophyll mg/m^3	PO_4 µgAt/l	S ‰	σ_t
0	6.78	3.13	1.31		
15	6.02	4.87	1.57		
30	4.03	0.64	1.98		
60	3.18	0.38	2.27		
92	2.43	0.40	2.44		

STATION: G-4	DEPTH: 106m	DATE: 5-2-70	TIME: 1115
LAT: 37°-00.1'N	LONG: 122°-23.3'W	WIND: 315°	SPEED: 10
AIR TEMP(DRY): 54°	BARO: 30.17	CLOUD AMT: 10	HEIGHT(FT): 100
SEA: --	SWELL: 315°-4		

Z (m)	SV (m/sec)	T (°C)	TRANS (%/m)	Z (m)	O_2 (ml/l)	Chlorophyll (mg/m^3)	PO_4 (µgAt/l)	S (‰)	σ_t
0	1487.4	9.70	26.8	0	6.65	2.53	1.19		
4	1487.4	9.69	26.6	15	6.20	4.77	1.37		
9	1487.1	9.60	29.8	35	5.98	3.13	1.57		
19	1486.2	9.28	41.8	55	4.52	0.45	1.91		
29	1486.1	9.21	45.6	85	2.49	0.40	2.36		
37	1486.1	9.15	49.8						
48	1484.4	8.75	79.0						
55	1484.3	8.61	88.4						
71	1483.9	8.41	85.1						
81	1483.6	8.27	83.2						
87	1483.2	8.13	83.7						

STATION: G-5	DEPTH: 120m	DATE: 5-2-70	TIME: 2000
LAT: 36°-59.4'N	LONG: 122°-24'W	WIND: 315°	SPEED: 13
AIR TEMP(DRY): 50°	BARO: 30.06	CLOUD AMT: 10	HEIGHT(FT): 100
SEA: 315°-1	SWELL: 315°-4		

Z (m)	SV (m/sec)	T (°C)	TRANS (%/m)	Z (m)	O_2 (ml/l)	Chlorophyll (mg/m^3)	PO_4 (µgAt/l)	S (‰)	σ_t
1	1487.9	9.85	19.3	0	6.96	3.07	1.20		
5	1488.0	9.84	18.8	25	5.58	2.20	1.71		
11	1488.2	9.84	18.8	40	5.01	3.97	1.23		
21	1487.2	9.57	28.9	80	3.11	0.61	2.26		
30	1486.0	9.19	46.9	100	2.62	0.35	2.40		
39	1483.3	8.43	75.4						
50	1483.2	8.33	75.4						
68	1483.2	8.19	74.6						
88	1483.0	8.05	71.8						
98	1483.0	8.01	67.9						

STATION: G-6	DEPTH: 530m	DATE: 5-2-70	TIME: 2200
LAT: 36^{o}-56.3'N	LONG: 122^{o}-28.6'W	WIND: 315^{o}	SPEED: 15
AIR TEMP(DRY): 50^{o}	BARO: 30.08	CLOUD AMT: 10	HEIGHT(FT): 100
SEA: 315^{o}-3	SWELL: 315^{o}-4		

Z m	SV m/sec	T °C	TRANS %/m	Z m	0_2 ml/l	Chlorophyll mg/m^3	PO_4 µgAt/l	S ‰	σ_t
0	1489.6	10.41	N	0	7.74	4.38	0.63		
4	1489.7	10.38	O	5	7.83	3.98	0.64		
8	1489.6	10.28		10	7.79	4.27	0.62		
12	1488.0	9.68	D	15	7.73	5.04	0.66		
20	1487.6	9.78	A	25	6.52	2.42	1.24		
30	1487.2	9.50	T	35	5.22	0.84	1.67		
41	1486.3	9.22	A	50	3.94	0.47	2.00		
52	1485.7	9.01		75	2.61	0.19	2.26		
61	1485.3	8.86							
72	1484.9	8.70							
81	1484.3	8.45							
90	1484.4	8.45							

STATION: G-7	DEPTH: 1554m	DATE: 5-3-70	TIME: 0100
LAT: 36^{o}-53.2'N	LONG: 122^{o}-33.4'W	WIND: 315^{o}	SPEED: 10
AIR TEMP(DRY): 49^{o}	BARO: 30.06	CLOUD AMT: 10	HEIGHT(FT): 100
SEA: 315^{o}-2	SWELL: 315^{o}-4		

Z m	SV m/sec	T °C	TRANS %/m	Z m	0_2 ml/l	Chlorophyll mg/m^3	PO_4 µgAt/l	S ‰	σ_t
0	1489.7	10.48	18.4	0	6.41	2.49	0.66		
1	1489.8	10.48	19.3	3	7.43	4.86	0.66		
3	1489.7	10.49	19.3	10	7.09	5.08	0.81		
9	1489.8	10.45	19.7	20	6.87	4.92	0.99		
20	1488.3	9.94	28.2	30	5.32	1.14	1.58		
31	1485.8	9.28	81.0	45	5.55	0.50	1.62		
40	1486.3	9.27	84.9	60	4.22	0.37	1.85		
49	1486.4	9.24	89.8	90	3.36	0.28	2.10		
69	1484.9	8.74	85.0						
89	1484.6	8.54	86.0						
97	1484.2	8.38	89.0						

STATION: H-1	DEPTH: 950m	DATE: 5-3-70	TIME: 0400
LAT: 36°-58.4'N	LONG: 122°-40.5'W	WIND: 315°	SPEED: 8
AIR TEMP(DRY): 48°	BARO: 30.04	CLOUD AMT: 10	HEIGHT(FT): 100
SEA: 315°-2	SWELL: 315°-4		

Z m	SV m/sec	T °C	TRANS %/m
0	1494.4	12.04	65.9
3	1494.5	12.09	64.7
5	1494.6	12.10	65.0
9	1493.2	11.57	69.6
18	1489.6	10.48	55.4
29	1488.9	10.16	62.9
37	1488.3	9.91	63.0
57	1487.5	9.56	67.6
71	1486.5	9.12	61.6
90	1486.2	8.96	52.0

Z m	O_2 ml/l	Chlorophyll mg/m^3	PO_4 µgAt/l	S ‰	σ_t
0	--	0.13	0.51		
5	6.33	0.14	0.50		
10	6.26	0.21	0.73		
18	--	1.17	0.90		
30	6.45	1.00	1.01		
50	6.11	1.20	1.30		
60	6.23	1.13	1.29		
90	5.59	1.16	1.53		

STATION: H-2	DEPTH: 900m	DATE: 5-3-70	TIME: 0800
LAT: 37°-02.6'N	LONG: 122°-48.4'W	WIND: 330°	SPEED: 13
AIR TEMP(DRY): 49°	BARO: 29.98	CLOUD AMT: 10	HEIGHT(FT): 100
SEA: 330°-1	SWELL: 330°-4		

Z m	SV m/sec	T °C	TRANS %/m
0	--	--	62.9
5	1495.7	12.45	63.9
10	1495.8	12.45	62.0
19	1495.4	12.28	63.3
29	1495.3	12.19	64.9
38	1493.4	11.51	86.1
49	1490.9	10.84	88.5
58	1487.3	9.61	94.6
67	1488.0	9.71	91.5
75	1487.8	9.64	92.0
83	1487.2	9.41	92.0
92	1486.1	9.04	94.8

Z m	O_2 ml/l	Chlorophyll mg/m^3	PO_4 µgAt/l	S ‰	σ_t
0	6.31	0.14	0.40		
5	6.36	0.14	0.42		
25	6.36	0.13	0.43		
50	5.72	0.12	1.14		
100	3.87	0.16	1.73		

STATION: I-1	DEPTH: 310m	DATE: 5-3-70	TIME: 1000
LAT: 37°-10'N	LONG: 122°-45.8'W	WIND: 325°	SPEED: 10
AIR TEMP(DRY): 49°	BARO: 29.99	CLOUD AMT: 10	HEIGHT(FT): 100
SEA: 325°-2	SWELL: 330°-4		

Z m	SV m/sec	T °C	TRANS %/m	Z m	O_2 ml/l	Chlorophyll mg/m^3	PO_4 µgAt/l	S ‰	σ_t
0	1495.0	12.22	66.5	0	6.43	0.19	0.47		
5	1495.1	12.24	67.0	10	6.44	0.15	0.48		
10	1495.2	12.23	66.0	30	6.43	0.11	0.83		
20	1494.0	11.78	65.2	60	5.09	0.11	1.49		
29	1490.6	10.86	84.0	100	3.67	0.12	1.85		
39	1485.9	9.40	89.6						
47	1485.1	9.10	92.9						
57	1485.5	9.11	94.7						
63	1485.5	8.98	94.0						
69	1485.5	8.94	94.2						
85	1485.2	8.77	94.8						
89	1484.8	8.63	95.1						
93	1484.4	8.48	94.1						

STATION: I-2	DEPTH: 131m	DATE: 5-3-70	TIME: 1100
LAT: 37°-10'N	LONG: 122°-41.8'W	WIND: 320°	SPEED: 10
AIR TEMP(DRY): 53°	BARO: 30.0	CLOUD AMT: 10	HEIGHT(FT): 500
SEA: 320°-2	SWELL: 330°-4		

Z m	SV m/sec	T °C	TRANS %/m	Z m	O_2 ml/l	Chlorophyll mg/m^3	PO_4 µgAt/l	S ‰	σ_t
0	1495.3	12.30	63.5	0	4.06	0.16	0.51		
5	1495.3	12.30	62.0	10	5.28	0.17	0.78		
9	1494.7	12.10	69.2	20	4.23	0.11	1.23		
18	1489.2	10.43	77.0	45	4.32	0.24	1.63		
29	1485.0	9.18	86.9	65	3.74	0.15	1.69		
38	1485.7	9.21	89.0	100	4.27	0.50	1.92		
48	1486.2	9.27	84.6						
55	1486.2	9.19	88.2						
68	1485.4	8.91	90.6						
79	1485.1	8.74	89.0						
85	1484.6	8.53	85.1						
98	1484.2	8.36	77.8						

STATION: I-3	DEPTH: 109m	DATE: 5-3-70	TIME: 1200
LAT: 37°-11.0'N	LONG: 122°-38.5'W	WIND: 315°	SPEED: 10
AIR TEMP(DRY): 61°	BARO: 30.00	CLOUD AMT: 10	HEIGHT(FT): 1000
SEA: 315°-2	SWELL: 330°-4		

Z m	SV m/sec	T °C	TRANS %/m	Z m	O_2 ml/l	Chlorophyll mg/m^3	PO_4 µgAt/l	S ‰	σ_t
0	1493.3	11.70	62.7	0	--	0.41	0.79		
4	1493.0	11.55	64.8	10	6.87	0.85	0.85		
9	1491.8	11.18	60.8	20	6.74	1.18	1.10		
18	1490.3	10.69	51.2	30	6.50	1.18	1.33		
28	1488.3	9.94	46.0	40	5.59	1.43	1.57		
32	1487.8	9.72	43.3	50	5.01	0.73	1.73		
36	1487.9	9.75	43.1	60	4.98	0.74	1.77		
45	1486.7	9.34	52.2	75	4.53	1.61	1.93		
53	1485.6	8.94	71.5						
60	1485.2	8.84	76.2						
66	1485.3	8.79	78.8						
73	1485.1	8.73	78.6						

STATION: I-4	DEPTH: 95m	DATE: 5-3-70	TIME: 1400
LAT: 37°-10.9'N	LONG: 122°-35.2'W	WIND: 320°	SPEED: 12
AIR TEMP(DRY): 56°	BARO: 29.95	CLOUD AMT: 10	HEIGHT(FT): 1000
SEA: 320°-3	SWELL: 330°-5		

Z m	SV m/sec	T °C	TRANS %/m	Z m	O_2 ml/l	Chlorophyll mg/m^3	PO_4 µgAt/l	S ‰	σ_t
0	1492.6	11.21	9.5	0	9.10	2.14	0.31		
2	1492.6	11.25	9.5	3	9.51	3.23	0.36		
5	1492.5	11.18	13.0	12	9.78	4.07	0.44		
7	1491.2	10.88	10.0	20	6.75	2.59	1.33		
10	1489.3	10.27	14.0	30	5.95	0.82	1.65		
13	1487.7	9.76	15.8	45	4.59	0.93	1.92		
18	1485.9	9.20	39.1	60	4.48	0.72	2.03		
27	1484.6	8.76	57.3	80	4.51	0.93	2.05		
36	1483.5	8.45	68.8						
44	1483.5	8.42	70.6						
56	1483.6	8.39	72.8						
63	1483.8	8.38	71.8						
70	1483.6	8.33	66.3						

STATION: I-5	DEPTH: 91m	DATE: 5-3-70	TIME: 1515
LAT: 37°-11'N	LONG: 122°-33.2'W	WIND: 325°	SPEED: 12
AIR TEMP(DRY): 56°	BARO: 29.94	CLOUD AMT: 10	HEIGHT(FT): 1000
SEA: 325°-3	SWELL: 330°-5		

Z m	SV m/sec	T °C	TRANS %/m
0	1491.2	10.81	9.5
3	1491.3	10.82	9.5
6	1491.2	10.77	9.6
11	1490.5	10.57	14.0
15	1487.0	9.56	33.8
21	1485.9	9.23	40.6
30	1484.6	8.80	56.7
40	1484.6	8.72	62.3
53	1483.9	8.48	49.8
62	1483.5	8.32	48.1
71	1483.3	8.22	53.0
80	1483.2	8.16	50.5

Z m	O_2 ml/l	Chlorophyll mg/m^3	PO_4 μgAt/l	S ‰	σ_t
0	10.12	2.84	0.33		
4	10.38	2.15	0.29		
15	7.52	1.47	1.08		
20	6.77	2.43	1.30		
25	6.36	2.45	1.39		
38	5.87	1.55	1.68		
50	6.13	1.07	1.62		
65	4.42	0.43	1.98		
80	3.68	0.93	2.14		

STATION: I-6	DEPTH: 85m	DATE: 5-3-70	TIME: 1645
LAT: 37°-10.8'N	LONG: 122°-31.3'W	WIND: 330°	SPEED: 14
AIR TEMP(DRY): 53°	BARO: 29.93	CLOUD AMT: 10	HEIGHT(FT): 700
SEA: 320°-3	SWELL: 330°-5		

Z m	SV m/sec	T °C	TRANS %/m
0	1489.9	10.45	9.6
3	1489.8	10.34	9.7
5	1489.6	10.23	9.1
10	1485.8	9.10	10.0
15	1484.9	8.88	13.9
20	1484.3	8.67	47.1
25	1484.1	8.58	68.0
30	1483.8	8.50	71.9
40	1483.6	8.43	79.4
50	1483.6	8.36	81.2
60	1483.6	8.32	74.8
70	1483.4	8.30	59.2
75	1483.5	8.27	59.0

Z m	O_2 ml/l	Chlorophyll mg/m^3	PO_4 μgAt/l	S ‰	σ_t
0	9.22	3.46	0.57		
5	9.47	4.09	0.51		
20	6.70	3.72	1.24		
35	5.13	0.45	1.81		
45	4.66	0.84	1.93		
55	4.10	0.55	2.01		
60	4.29	0.59	2.03		
70	3.80	0.55	2.08		
75	3.67	0.63	2.20		

STATION: I-7	DEPTH: 73m	DATE: 5-3-70	TIME: 1800
LAT: 37°-11'N	LONG: 122°-29.1'W	WIND: 340°	SPEED: 15
AIR TEMP(DRY): 50°	BARO: 29.91	CLOUD AMT: 10	HEIGHT(FT): 500
SEA: 320°-4	SWELL: 320°-8		

Z	SV	T	TRANS	Z	O_2	Chloro-phyll	PO_4	S	σ_t
m	m/sec	°C	%/m	m	ml/l	mg/m^3	µgAt/l	‰	
0	1489.2	10.21	10.2	0	8.27	5.59	0.70		
5	1489.3	10.17	10.6	5	8.50	5.39	0.77		
9	1488.9	10.09	13.2	15	7.01	4.11	1.13		
15	1485.9	9.24	52.5	25	5.17	2.15	1.73		
19	1484.9	9.02	73.0	50	4.26	0.41	2.02		
30	1484.1	8.70	81.9						
40	1484.0	8.59	81.4						
49	1483.9	8.51	79.5						
59	1483.4	8.35	76.4						
63	1483.2	8.28	60.5						

STATION: I-8	DEPTH: 57m	DATE: 5-3-70	TIME: 1900
LAT: 37°-10.4'N	LONG: 122°-26.7'W	WIND: 340°	SPEED: 16
AIR TEMP(DRY): 49°	BARO: 29.91	CLOUD AMT: 10	HEIGHT(FT): 50
SEA: 325°-4	SWELL: 325°-8		

Z	SV	T	TRANS	Z	O_2	Chloro-phyll	PO_4	S	σ_t
m	m/sec	°C	%/m	m	ml/l	mg/m^3	µgAt/l	‰	
0	1487.9	9.85	16.2	0	7.62	2.56	1.00		
6	1488.0	9.82	16.6	5	7.57	2.52	1.00		
10	1486.6	9.49	39.6	15	5.64	1.49	1.65		
16	1484.9	8.97	70.7	20	5.05	0.72	1.85		
19	1484.1	8.74	73.3	30	4.63	0.54	2.06		
25	1483.6	8.57	79.0	40	4.46	0.52	2.09		
29	1483.6	8.52	71.2						
40	1483.6	8.50	67.3						
48	1483.7	8.46	68.9						

STATION: I-9	DEPTH: 33m	DATE: 5-3-70	TIME: 2000
LAT: 37°-10.9'N	LONG: 122°-25.2'W	WIND: 335°	SPEED: 17
AIR TEMP(DRY): 49°	BARO: 29.91	CLOUD AMT: 10	HEIGHT(FT): 50
SEA: 325°-4	SWELL: 330°-8		

Z m	SV m/sec	T °C	TRANS %/m	Z m	O_2 ml/l	Chloro-phyll mg/m^3	PO_4 μgAt/l	S ‰	σ_t
1	1486.0	9.35	28.8	0	6.34	2.17	1.57		
6	1486.2	9.33	29.4	5	6.35	6.13	1.56		
10	1486.2	9.32	29.8	10	6.16	3.76	1.65		
15	1485.6	9.14	36.4	20	5.33	1.32	1.98		
19	1484.9	8.94	45.3						
24	1484.4	8.78	44.5						

STATION: J-1	DEPTH: 33m	DATE: 5-3-70	TIME: 2100
LAT: 37°-15.8'N	LONG: 122°-27.5'W	WIND: 325°	SPEED: 13
AIR TEMP(DRY): 49°	BARO: 29.93	CLOUD AMT: 10	HEIGHT(FT): 75
SEA: 320°-3	SWELL: 320°-7		

Z m	SV m/sec	T °C	TRANS %/m	Z m	O_2 ml/l	Chloro-phyll mg/m^3	PO_4 μgAt/l	S ‰	σ_t
0	1489.4	10.26	11.0	0	8.34	5.16	0.86		
5	1489.6	10.26	11.0	5	8.58	4.82	0.86		
9	1488.8	10.05	17.9	11	8.31	5.89	0.93		
15	1486.0	9.26	39.9	22	4.87	0.86	2.02		
20	1484.7	8.91	53.0						
25	1483.7	8.57	56.6						

STATION: J-2	DEPTH: 38m	DATE: 5-3-70	TIME: 2200
LAT: 37°-21.6'N	LONG: 122°-29.6'W	WIND: 315°	SPEED: 10
AIR TEMP(DRY): 49°	BARO: 29.94	CLOUD AMT: 10	HEIGHT(FT): 100
SEA: 315°-2	SWELL: 315°-6		

Z	SV	T	TRANS	Z	O_2	Chlorophyll	PO_4	S	σ_t
m	m/sec	°C	%/m	m	ml/l	mg/m^3	μgAt/l	‰	
0	1488.2	9.93	19.0	0	7.95	3.86	1.07		
6	1488.2	9.93	19.4	5	8.15	2.89	1.10		
9	1488.1	9.87	21.4	15	6.05	2.49	1.68		
14	1485.2	9.06	72.3	23	4.66	0.70	2.15		
20	1484.3	8.74	63.2	30	3.82	1.48	2.45		
24	1483.9	8.64	54.9						
28	1484.0	8.62	39.8						

STATION: J-3	DEPTH: 45m	DATE: 5-3-70	TIME: 2330
LAT: 37°-26.7'N	LONG: 122°-31.7'W	WIND: 315°	SPEED: 8
AIR TEMP(DRY): 49°	BARO: 29.97	CLOUD AMT: 10	HEIGHT(FT): 100
SEA: 315°-2	SWELL: 315°-4		

Z	SV	T	TRANS	Z	O_2	Chlorophyll	PO_4	S	σ_t
m	m/sec	°C	%/m	m	ml/l	mg/m^3	μgAt/l	‰	
0	1490.2	10.54	9.5	0	9.70	6.71	0.49		
5	1490.3	10.53	9.3	5	11.21	4.28	0.51		
10	1486.7	9.51	31.5	15	7.30	2.82	1.46		
16	1484.8	8.93	54.3	20	5.79	1.47	1.87		
21	1484.2	8.72	61.7	29	4.50	0.85	2.26		
26	1483.8	8.59	63.0	35	4.70	0.48	2.33		
31	1483.8	8.58	63.3						
36	1484.0	8.58	39.4						
39	1484.0	8.58	36.2						

STATION: J-4	DEPTH: 39m	DATE: 5-4-70	TIME: 0100
LAT: 37°-31.9'N	LONG: 122°-33.4'W	WIND: 315°	SPEED: 8
AIR TEMP(DRY): 51°	BARO: 29.95	CLOUD AMT: 10	HEIGHT(FT): 100
SEA: 315°-2	SWELL: 315°-4		

Z m	SV m/sec	T °C	TRANS %/m
0	1494.3	9.92	19.8
4	1488.6	9.74	20.4
8	1485.6	8.98	24.1
12	1484.7	8.80	64.9
16	1484.0	8.66	59.2
19	1483.9	8.64	57.0
25	1484.1	8.64	56.0
29	1484.0	8.61	53.7
33	1484.2	8.61	52.4

Z m	O_2 ml/l	Chlorophyll mg/m^3	PO_4 µgAt/l	S ‰	σ_t
0	7.36	3.65	1.44		
4	7.61	4.18	1.49		
12	6.89	3.89	1.51		
16	6.12	3.93	1.81		
25	4.81	0.71	2.32		
29	4.98	0.71	2.33		

STATION: K-1	DEPTH: 46m	DATE: 5-4-70	TIME: 0200
LAT: 37°-31.6'N	LONG: 122°-35.2'W	WIND: 315°	SPEED: 8
AIR TEMP(DRY): 52°	BARO: 29.92	CLOUD AMT: 10	HEIGHT(FT): 100
SEA: 315°-2	SWELL: 315°-4		

Z m	SV m/sec	T °C	TRANS %/m
0	--	--	4.1
3	1492.3	11.12	5.2
5	1492.1	10.52	5.5
9	1485.9	9.32	31.4
12	1484.4	8.85	64.0
15	1483.8	8.59	76.9
20	1483.8	8.62	73.8
24	1483.8	8.57	68.5
29	1483.8	8.58	52.9
34	1484.0	8.58	35.8
40	1484.0	8.57	24.2

Z m	O_2 ml/l	Chlorophyll mg/m^3	PO_4 µgAt/l	S ‰	σ_t
0	--	5.87	0.52		
5	9.69	5.81	0.48		
15	6.73	5.25	1.61		
20	5.74	3.03	1.90		
25	5.40	1.37	2.11		
35	5.04	1.16	2.39		

STATION: K-2	DEPTH: 48m	DATE: 5-4-70	TIME: 0335
LAT: 37°-32.1'N	LONG: 122°-37.1'W	WIND: 315°	SPEED: 10
AIR TEMP(DRY): 51°	BARO: 29.95	CLOUD AMT: 10	HEIGHT(FT): 100
SEA: 310°-2	SWELL: 315°-4		

Z m	SV m/sec	T °C	TRANS %/m	Z m	O_2 ml/l	Chlorophyll mg/m^3	PO_4 µgAt/l	S ‰	σ_t
0	1493.6	11.65	5.0	0	10.56	2.65	0.38		
3	1493.5	11.64	5.0	5	9.93	6.20	0.51		
6	1493.5	11.66	4.6	12	6.65	7.54	1.63		
8	1487.1	9.78	17.2	20	5.30	1.17	2.09		
12	1486.6	9.42	39.2	27	4.99	0.63	2.13		
15	1485.3	9.10	69.4	40	5.08	0.93	2.38		
20	1484.5	8.86	69.2						
24	1483.6	8.58	69 6						
27	1483.7	8.56	63.7						
34	1483.7	8.56	59.2						
38	1483.8	8.55	52.4						
40	1483.9	8.56	27.5						

STATION: K-3	DEPTH: 50m	DATE: 5-4-70	TIME: 0435
LAT: 37°-31.9'N	LONG: 122°-38.7'W	WIND: 315°	SPEED: 10
AIR TEMP(DRY): 51°	BARO: 29.95	CLOUD AMT: 10	HEIGHT(FT): 100
SEA: 315°-2	SWELL: 315°-4		

Z m	SV m/sec	T °C	TRANS %/m	Z m	O_2 ml/l	Chlorophyll mg/m^3	PO_4 µgAt/l	S ‰	σ_t
0	1492.3	11.35	5.3	0	10.48	6.30	0.38		
2	1492.3	11.34	5.3	3	10.59	2.72	0.37		
5	1492.4	11.34	5.4	17	--	4.55	1.42		
8	1492.3	11.28	14.5	24	5.36	1.77	1.83		
11	1486.8	9.52	19.0	29	5.17	0.69	2.15		
14	1486.0	9.28	35.5	44	4.68	2.17	2.50		
20	1484.5	8.75	67.8						
24	1483.5	8.53	62.5						
30	1483.6	8.52	65.5						
34	1483.7	8.53	65.2						
40	1483.8	8.52	42.0						
44	1483.9	8.53	24.8						

STATION: K-4	DEPTH: 57m	DATE: 5-4-70	TIME: 0530
LAT: 37°-32.2'N	LONG: 122°-41.3'W	WIND: 310°	SPEED: 9
AIR TEMP(DRY): 50°	BARO: 29.96	CLOUD AMT: 10	HEIGHT(FT): 700
SEA: 310°-2	SWELL: 300°-6		

Z m	SV m/sec	T °C	TRANS %/m
0	1492.6	11.41	22.1
3	1492.7	11.40	22.2
5	1492.8	11.44	22.2
8	1492.8	11.42	21.2
11	1487.4	9.73	8.9
14	1486.3	9.36	19.0
17	1485.7	9.15	43.7
21	1484.8	8.90	54.6
24	1484.6	8.82	56.1
29	1484.3	8.70	62.2
35	1484.1	8.65	58.4
39	1484.1	8.59	59.7
44	1484.1	8.57	54.3
50	1483.4	8.38	29.8

Z m	O_2 ml/l	Chloro-phyll mg/m^3	PO_4 µgAt/l	S ‰	σ_t
0	10.72	0.57	0.34		
5	10.61	2.20	0.29		
12	9.04	3.85	0.40		
29	6.03	1.08	1.64		
44	5.28	1.53	1.92		
47	4.85	1.98	2.11		

STATION: K-5	DEPTH: 64m	DATE: 5-4-70	TIME: 0635
LAT: 37°-31.9'N	LONG: 122°-43.1'W	WIND: 310°	SPEED: 9
AIR TEMP(DRY): 50°	BARO: 29.96	CLOUD AMT: 10	HEIGHT(FT): 800
SEA: 310°-2	SWELL: 300°-6		

Z m	SV m/sec	T °C	TRANS %/m
0	1492.5	11.18	31.8
3	1492.6	11.26	31.7
5	1492.6	11.24	32.9
9	1490.6	10.59	16.7
14	1485.6	9.29	32.9
20	1485.0	8.96	39.0
24	1484.1	8.69	60.9
29	1484.1	8.66	58.0
34	1484.2	8.66	58.7
39	1484.1	8.62	59.3
44	1483.9	8.54	33.1
48	1483.7	8.44	22.2
52	1483.6	8.40	20.5
57	1483.7	8.39	14.9

Z m	O_2 ml/l	Chloro-phyll mg/m^3	PO_4 µgAt/l	S ‰	σ_t
0	9.32	1.44	0.15		
5	9.79	1.52	0.11		
10	9.87	2.26	0.18		
29	6.35	1.54	1.54		
39	5.44	0.71	1.85		
52	4.63	4.14	2.32		

STATION: K-6	DEPTH: 77m	DATE: 5-4-70	TIME: 0800
LAT: 37°-31.6'N	LONG: 122°-46.9'W	WIND: 320°	SPEED: 9
AIR TEMP(DRY): 50°	BARO: 29.94	CLOUD AMT: 10	HEIGHT(FT): 900
SEA: 320°-1	SWELL: 300°-6		

Z (m)	SV (m/sec)	T (°C)	TRANS (%/m)
0	1486.2	9.76	62.3
5	1487.3	9.76	62.3
10	1487.4	9.75	45.9
15	1487.5	9.72	33.4
25	1485.5	9.14	78.5
34	1485.5	8.78	70.8
47	1484.4	8.64	65.7
58	1484.4	8.63	62.2
62	1484.5	8.59	61.6
66	1484.4	8.58	63.3

Z (m)	O_2 (ml/l)	Chlorophyll (mg/m^3)	PO_4 (µgAt/l)	S (‰)	σ_t
0	6.16	1.04	1.20		
10	6.44	2.18	1.13		
30	5.18	0.89	1.70		
40	5.06	1.06	1.77		
60	5.17	1.29	1.86		

STATION: K-7	DEPTH: 86m	DATE: 5-4-70	TIME: 0900
LAT: 37°-32'N	LONG: 122°-49.9'W	WIND: 315°	SPEED: 8
AIR TEMP(DRY): 53°	BARO: 29.96	CLOUD AMT: 10	HEIGHT(FT):1000
SEA: 310°-2	SWELL: 310°-5		

Z (m)	SV (m/sec)	T (°C)	TRANS (%/m)
0	1489.6	10.49	63.1
5	1489.8	10.50	62.4
9	1489.7	10.46	61.3
20	1489.6	10.37	59.8
30	1489.5	10.30	59.4
40	1488.8	10.10	59.9
48	1488.0	9.74	46.4
56	1485.5	8.99	86.7
65	1484.9	8.76	87.2
71	1484.1	8.46	87.9
79	1483.4	8.21	74.1

Z (m)	O_2 (ml/l)	Chlorophyll (mg/m^3)	PO_4 (µgAt/l)	S (‰)	σ_t
0	6.67	0.62	0.89		
10	6.76	0.83	0.92		
30	6.63	0.94	0.98		
40	6.25	1.66	1.11		
50	4.82	0.35	1.70		
60	--	0.28	1.78		

STATION: K-8	DEPTH: 100m	DATE: 5-4-70	TIME: 1000
LAT: 37°-32.3'N	LONG: 122°-54.5'W	WIND: 310°	SPEED: 8
AIR TEMP(DRY): 55°	BARO: 29.96	CLOUD AMT: 10	HEIGHT(FT): 1000
SEA: 310°-2	SWELL: 315°-4		

Z m	SV m/sec	T °C	TRANS %/m
0	1491.2	10.98	61.2
5	1491.4	11.02	61.2
9	1491.3	10.91	53.8
18	1488.5	10.11	75.8
29	1485.6	9.27	86.6
39	1485.7	9.15	87.0
58	1484.9	8.79	89.0
76	1484.0	8.46	88.6
84	1483.4	8.24	86.1
88	1483.4	8.22	85.5
91	1483.3	8.18	82.6

Z m	O_2 ml/l	Chlorophyll mg/m^3	PO_4 µgAt/l	S ‰	σ_t
0	6.65	0.42	0.73		
7	6.97	0.82	0.71		
20	5.37	0.56	1.28		
30	4.89	0.33	1.50		
50	4.08	0.33	1.75		
70	3.50	0.16	1.87		
90	3.65	0.23	1.98		

STATION: K-9	DEPTH: 167m	DATE: 5-4-70	TIME: 1200
LAT: 37°-31.2'N	LONG: 122°-58'W	WIND: 315°	SPEED: 13
AIR TEMP(DRY): 59°	BARO: 30.02	CLOUD AMT: 10	HEIGHT(FT): 1000
SEA: 315°-2	SWELL: 315°-4		

Z m	SV m/sec	T °C	TRANS %/m
0	1493.9	11.88	68.2
6	1493.9	11.87	68.8
9	1491.4	11.04	63.5
15	1490.3	10.62	67.9
19	1489.4	10.37	70.0
28	1487.7	9.75	65.6
39	1485.4	9.13	83.6
56	1484.8	8.75	90.2
71	1484.3	8.54	90.2
89	1484.2	8.46	90.6

Z m	O_2 ml/l	Chlorophyll mg/m^3	PO_4 µgAt/l	S ‰	σ_t
0	6.56	0.15	0.61		
10	6.46	0.28	0.76		
15	7.72	0.35	0.85		
25	6.53	0.41	1.10		
40	5.38	0.49	1.50		
70	3.73	0.11	1.86		
100	3.84	0.09	1.97		

STATION: K-10	DEPTH: 755m	DATE: 5-4-70	TIME: 1330
LAT: 37°-32.3'N	LONG: 123°-03.8'W	WIND: 315°	SPEED: 14
AIR TEMP(DRY): 58°	BARO: 30.00	CLOUD AMT: 8	HEIGHT(FT): 4000
SEA: 315°-2	SWELL: 315°-4		

Z m	SV m/sec	T °C	TRANS %/m
0	1495.1	12.27	72.6
6	1495.3	12.28	72.6
9	1495.3	12.25	73.1
14	1495.2	12.20	76.5
19	1488.7	10.27	90.8
24	1489.8	10.48	87.7
29	1489.8	10.45	88.4
38	1488.2	9.93	78.7
47	1487.1	9.47	75.4
61	1486.2	9.13	81.8
75	1485.5	8.86	80.6
93	1484.1	8.39	96.0
100	1484.1	8.34	96.0

Z m	O_2 ml/l	Chlorophyll mg/m^3	PO_4 µgAt/l	S ‰	σ_t
0	6.42	0.11	0.46		
10	6.02	0.14	0.48		
15	5.98	0.10	0.74		
25	6.58	0.13	0.99		
36	6.36	0.18	1.15		
50	5.96	0.69	1.45		
67	5.58	0.89	1.56		
100	3.85	0.22	1.95		

STATION: K-11	DEPTH: 1175m	DATE: 5-4-70	TIME: 1500
LAT: 37°-32.4'N	LONG: 123°-09.3'W	WIND: 310°	SPEED: 14
AIR TEMP(DRY): 55°	BARO: 29.99	CLOUD AMT: 7	HEIGHT(FT): 4000
SEA: 305°-2	SWELL: 315°-4		

Z m	SV m/sec	T °C	TRANS %/m
0	1494.4	12.06	63.8
4	1494.6	12.07	61.8
8	1494.3	11.98	60.6
15	1494.0	11.87	71.0
21	1489.8	10.58	75.8
24	1489.9	10.52	80.1
34	1488.2	9.97	85.1
44	1487.8	9.75	82.3
54	1486.8	9.40	87.5
72	1486.6	9.23	76.5
88	1486.0	8.98	79.5
100	1486.0	8.86	84.2

Z m	O_2 ml/l	Chlorophyll mg/m^3	PO_4 µgAt/l	S ‰	σ_t
0	6.44	0.16	0.50		
5	6.46	0.17	0.50		
15	6.51	0.15	0.66		
36	6.19	0.14	1.22		
41	5.75	0.14	1.33		
55	5.19	0.12	1.54		
68	5.57	0.54	1.58		
80	5.44	0.44	1.77		
100	6.08	0.11	0.64		

STATION: L-1	DEPTH: 1463m	DATE: 5-4-70	TIME: 1645
LAT: 37°-36.8'N	LONG: 123°-15.4'W	WIND: 300°	SPEED: 14
AIR TEMP(DRY): 52°	BARO: 30.00	CLOUD AMT: 5	HEIGHT(FT): 3700
SEA: 305°-2	SWELL: 310°-4		

Z	SV	T	TRANS	Z	O_2	Chlorophyll	PO_4	S	σ_t
m	m/sec	°C	%/m	m	ml/l	mg/m^3	μgAt/l	‰	
0	1491.6	11.07	64.7	0	7.07	0.25	0.89		
5	1491.8	11.09	66.4	5	6.90	0.25	0.86		
10	1490.3	10.61	68.5	10	6.94	0.22	0.89		
14	1487.9	9.91	61.2	15	6.81	0.40	1.09		
19	1487.1	9.64	55.8	30	6.04	1.43	1.39		
24	1486.8	9.52	58.2	50	5.09	0.72	1.75		
34	1486.3	9.32	70.4	75	4.92	0.22	1.88		
44	1485.5	9.05	83.3	100	5.17	0.26	1.88		
55	1485.2	8.90	89.3	150	3.22	0.12	2.09		
64	1485.0	8.79	90.1	200	3.89	0.21	2.06		
75	1485.0	8.72	88.4						
84	1484.6	8.57	88.0						
100	1484.9	8.55	87.0						

STATION: L-2	DEPTH: 146m	DATE: 5-4-70	TIME: 1800
LAT: 37°-42.2'N	LONG: 123°-07.7'W	WIND: 290°	SPEED: 14
AIR TEMP(DRY): 55°	BARO: 30.00	CLOUD AMT: 4	HEIGHT(FT): 3500
SEA: 300°-2	SWELL: 310°-4		

Z	SV	T	TRANS	Z	O_2	Chlorophyll	PO_4	S	σ_t
m	m/sec	°C	%/m	m	ml/l	mg/m^3	μgAt/l	‰	
0	1489.4	10.46	77.2	0	6.46	0.17	1.00		
5	1489.4	10.45	77.5	5	6.71	0.21	1.03		
11	1485.4	9.36	83.8	15	5.55	0.20	1.26		
15	1484.6	8.99	85.0	30	5.30	0.51	1.44		
21	1485.3	9.15	84.2	50	4.83	0.31	1.65		
31	1485.4	9.13	84.7	75	3.42	0.11	1.97		
40	1485.8	9.15	84.7	100	3.38	0.12	2.03		
59	1484.6	8.73	89.3						
78	1483.6	8.40	90.9						
94	1482.5	7.94	83.9						

STATION: L-3	DEPTH: 71m	DATE: 5-4-70	TIME: 2000
LAT: 37°-47.7'N	LONG: 122°-59.7'W	WIND: 290°	SPEED: 13
AIR TEMP(DRY): 53°	BARO: 30.02	CLOUD AMT: 8	HEIGHT(FT): 1500
SEA: 280°-2	SWELL: 290°-4		

Z	SV	T	TRANS
m	m/sec	°C	%/m
0	1489.2	10.19	6.1
6	1489.2	10.17	6.1
10	1487.3	9.65	10.9
20	1485.1	8.95	32.1
31	1483.9	8.60	52.2
39	1483.5	8.43	70.8
49	1483.3	8.36	68.2
59	1482.8	8.16	61.5
63	1482.1	7.98	51.8

Z	O_2	Chlorophyll	PO_4	S	σ_t
m	ml/l	mg/m^3	µgAt/l	‰	
0	9.06	2.62	0.67		
5	9.28	3.23	0.42		
20	5.89	0.76	1.58		
30	4.81	1.37	1.86		
45	4.40	1.95	1.96		
60	4.20	1.16	2.08		

STATION: L-4	DEPTH: 55m	DATE: 5-4-70	TIME: 2130
LAT: 37°-52.6'N	LONG: 122°-52.5'W	WIND: 295°	SPEED: 19
AIR TEMP(DRY): 54°	BARO: 30.04	CLOUD AMT: 10	HEIGHT(FT): 1500
SEA: 295°-4	SWELL: 290°-4		

Z	SV	T	TRANS
m	m/sec	°C	%/m
0	1488.3	9.94	12.0
5	1488.4	9.94	11.7
10	1488.4	9.95	11.7
15	1486.4	9.42	28.7
19	1484.6	8.87	67.1
29	1484.1	8.65	72.7
39	1483.6	8.49	78.1
44	1483.6	8.44	63.5
49	1483.6	8.44	52.9

Z	O_2	Chlorophyll	PO_4	S	σ_t
m	ml/l	mg/m^3	µgAt/l	‰	
0	8.36	2.67	0.69		
10	8.37	4.06	0.72		
25	5.79	1.07	1.69		
45	4.74	0.94	1.98		

STATION: M-1	DEPTH: 47m	DATE: 5-4-70	TIME: 2200
LAT: 37°-53.2'N	LONG: 122°-49.2'W	WIND: 295°	SPEED: 20
AIR TEMP(DRY): 54°	BARO: 30.05	CLOUD AMT: 10	HEIGHT(FT): 1500
SEA: 295°-4	SWELL: 290°-4		

Z m	SV m/sec	T °C	TRANS %/m
0	1488.3	9.94	9.8
4	1488.4	9.96	9.8
8	1488.4	9.92	10.4
14	1486.2	9.32	29.7
19	1484.8	8.91	64.1
23	1484.6	8.83	67.0
28	1484.3	8.71	69.6
32	1484.1	8.65	69.0
38	1483.7	8.51	46.1

Z m	O_2 ml/l	Chlorophyll mg/m^3	PO_4 μgAt/l	S ‰	σ_t
0	9.04	2.41	0.51		
5	8.74	6.33	0.53		
10	9.12	4.82	0.60		
20	6.38	1.52	1.49		
30	5.63	1.00	1.69		

STATION: M-2	DEPTH: 52m	DATE: 5-4-70	TIME: 2330
LAT: 37°-49'N	LONG: 122°-48.8'W	WIND: 290°	SPEED: 14
AIR TEMP(DRY): 54°	BARO: 30.04	CLOUD AMT: 10	HEIGHT(FT): 1500
SEA: 290°-4	SWELL: 290°-4		

Z m	SV m/sec	T °C	TRANS %/m
0	1487.0	9.58	17.7
6	1487.0	9.60	16.6
10	1486.4	9.44	32.3
19	1484.8	8.91	54.9
29	1484.2	8.70	71.0
34	1483.9	8.60	67.6
39	1483.7	8.51	61.8
43	1483.8	8.50	55.7

Z m	O_2 ml/l	Chlorophyll mg/m^3	PO_4 μgAt/l	S ‰	σ_t
0	7.41	6.18	0.94		
10	7.53	3.77	1.15		
25	5.76	0.78	1.70		
30	6.03	0.88	1.72		
40	5.16	0.69	1.86		

STATION: M-3	DEPTH: 46m	DATE: 5-5-70	TIME: 0045
LAT: 37°-46.4'N	LONG: 122°-46.9'W	WIND: 280°	SPEED: 10
AIR TEMP(DRY): 52°	BARO: 30.03	CLOUD AMT: 10	HEIGHT(FT): 1000
SEA: 280°-4	SWELL: 280°-4		

Z m	SV m/sec	T $^{\circ}$C	TRANS %/m	Z m	O_2 ml/1	Chlorophyll mg/m^3	PO_4 µgAt/1	S ‰	σ_t
0	1484.6	8.95	49.6	0	6.05	0.72	1.67		
3	1484.8	8.94	49.8	3	4.91	0.36	1.88		
5	1484.7	8.94	50.4	10	5.68	1.02	1.77		
9	1484.8	8.93	50.3	15	6.15	0.87	1.97		
20	1483.0	8.43	65.2	29	4.74	0.77	2.16		
25	1483.4	8.40	51.0						
30	1482.9	8.33	55.5						
40	1483.0	8.32	49.0						
42	1483.1	8.33	47.0						

STATION: M-4	DEPTH: 36m	DATE: 5-5-70	TIME: 0200
LAT: 37°-43.5'N	LONG: 122°-44.5'W	WIND: 270°	SPEED: 9
AIR TEMP(DRY): 50°	BARO: 30.02	CLOUD AMT: 10	HEIGHT(FT): 1000
SEA: 270°-3	SWELL: 270°-5		

Z m	SV m/sec	T $^{\circ}$C	TRANS %/m	Z m	O_2 ml/1	Chlorophyll mg/m^3	PO_4 µgAt/1	S ‰	σ_t
0	1490.3	10.71	16.0	0	8.54	4.82	0.83		
3	1490.3	10.73	16.1	3	8.56	2.96	0.83		
5	1490.3	10.72	15.2	10	7.45	1.25	1.45		
9	1488.8	10.22	38.1	15	6.29	0.93	2.17		
12	1485.2	9.41	65.0	29	4.41	1.03	2.24		
15	1483.5	8.57	67.0						
19	1483.2	8.42	54.2						
24	1482.8	8.33	44.0						
29	1482.8	8.28	36.6						
30	1482.7	8.25	33.1						

STATION: M-5	DEPTH: 33m	DATE: 5-5-70	TIME: 0300
LAT: 37°-40.2'N	LONG: 122°-42.1'W	WIND: 270°	SPEED: 10
AIR TEMP(DRY): 50°	BARO: 30.01	CLOUD AMT: 10	HEIGHT(FT): 1000
SEA: 270°-3	SWELL: 270°-5		

Z m	SV m/sec	T °C	TRANS %/m
0	1490.0	10.81	19.1
3	1490.0	10.76	19.1
5	1490.1	10.81	18.8
10	1487.9	9.82	44.0
14	1484.1	8.75	67.0
21	1483.3	8.48	44.9
25	1483.2	8.45	36.5
28	1483.3	8.44	33.6

Z m	O_2 ml/l	Chlorophyll mg/m^3	PO_4 μgAt/l	S ‰	σ_t
0	6.59	1.15	1.35		
3	7.23	1.55	1.40		
8	6.84	2.86	1.10		
12	7.24	3.90	0.98		
24	5.47	1.73	1.60		

STATION: M-6	DEPTH: 36m	DATE: 5-5-70	TIME: 0400
LAT: 37°-37.5'N	LONG: 122°-40.2'W	WIND: 270°	SPEED: 10
AIR TEMP(DRY): 50°	BARO: 30.00	CLOUD AMT: 10	HEIGHT(FT): 1000
SEA: 270°-3	SWELL: 270°-6		

Z m	SV m/sec	T °C	TRANS %/m
0	1490.3	10.80	23.0
3	1490.6	10.87	22.8
5	1490.7	10.87	21.2
11	1486.1	9.40	46.8
15	1485.5	9.09	48.3
20	1484.4	8.76	61.9
24	1484.0	8.64	60.4
31	1483.7	8.54	18.0

Z m	O_2 ml/l	Chlorophyll mg/m^3	PO_4 μgAt/l	S ‰	σ_t
2	8.36	2.91	0.87		
11	8.61	4.51	0.65		
14	7.18	5.05	0.96		
17	6.54	3.17	1.41		
25	5.52	0.92	1.62		

STATION: M-7	DEPTH: 29m	DATE: 5-5-70	TIME: 0530
LAT: 37°-37.3'N	LONG: 123°-36.6'W	WIND: --	SPEED: --
AIR TEMP(DRY): 51°	BARO: 30.02	CLOUD AMT: 10	HEIGHT(FT): 500
SEA: 270°-3	SWELL: 290°-6		

Z m	SV m/sec	T °C	TRANS %/m
0	1489.5	10.62	18.1
3	1489.4	10.41	18.1
5	1487.3	9.21	17.0
10	1484.8	8.78	27.8
15	1483.6	8.59	40.8
20	1483.8	8.60	32.8
23	1483.8	8.60	27.0
24	1483.8	8.60	23.0

Z m	O_2 ml/l	Chlorophyll mg/m^3	PO_4 µgAt/l	S ‰	σ_t
0	6.69	1.50	1.60		
5	6.64	2.91	1.49		
10	6.52	6.50	1.42		
16	5.39	0.48	1.65		
20	4.84	0.75	1.86		

STATION:	DEPTH:	DATE:	TIME:
LAT:	LONG:	WIND:	SPEED:
AIR TEMP(DRY):	BARO:	CLOUD AMT:	HEIGHT(FT):
SEA:	SWELL:		

Z m	SV m/sec	T °C	TRANS %/m

Z m	O_2 ml/l	Chlorophyll mg/m^3	PO_4 µgAt/l	S ‰	σ_t

TABLE II

Particle Size Distributions

DATE TIME	SAMPLE DEPTH	CUMU-LATIVE VOLUME	CUMU-LATIVE COUNT x 10^{-3}	Counts x 10^{-2} Channel Number and Equivalent Spherical Diameter μ													
				0	1	2	3	4	5	6	7	8	9	10	11	12	13
				(32.0)	(25.4)	(20.2)	(16.0)	(12.7)	(10.08)	(8.00)	(6.35)	(5.04)	(4.00)	(3.17)	(2.52)	(2.00)	(1.59)
								STATION									
								A-1									
29	0	424	53.1	0.2	0.3	1.4	7.3	16.8	26.2	27.0	18.9	20.4	22.3	21.7	31.1	63.2	274.7
April	2	354	50.0	0.2	0.2	0.8	6.8	16.2	19.8	17.6	14.7	17.9	23.0	21.4	31.5	63.3	266.1
1130	5	160	36.9	0.1	0.2	0.7	2.1	6.6	8.2	9.4	8.0	9.0	10.9	13.6	19.4	37.0	243.9
	10	112	20.0	0.1	0.1	0.4	2.0	4.2	5.7	5.5	5.4	5.5	7.6	9.7	13.9	24.1	115.7
	15	15	12.6	0.0	0.0	0.1	0.1	0.2	0.6	1.3	1.9	2.4	3.6	5.1	7.2	11.4	92.4
	20	20	14.3	0.0	0.0	0.0	0.2	0.3	1.1	1.5	2.8	4.2	5.4	8.2	11.5	18.3	89.9
	30	391	41.6	0.2	0.3	2.0	8.8	15.8	18.4	12.4	13.0	12.8	17.4	15.3	22.4	44.9	232.1
	60	32	17.4	0.0	0.0	0.1	0.3	0.5	1.5	2.5	3.5	5.0	6.6	9.2	13.4	21.7	109.7
								A-2									
29	0	462	111.5	0.2	0.5	2.6	6.8	18.2	24.3	23.9	17.0	19.1	28.2	26.4	39.7	89.8	818.4
April	5	278	237.7	0.2	0.5	1.6	4.5	8.2	11.0	9.6	5.0	4.5	7.8	14.4	45.4	231.9	2032.7
1330	10	370	53.7	0.2	0.5	1.5	6.2	15.7	18.2	16.6	15.1	15.1	23.1	24.3	35.5	63.7	301.2
	20	323	104.2	0.1	0.4	1.7	5.8	12.9	13.0	11.4	11.8	15.0	23.4	30.0	73.9	164.5	678.1
	35	80	157.3	0.0	0.0	0.3	0.8	1.6	2.5	2.4	6.7	8.9	13.8	19.7	27.9	50.4	1435.8
	50	47	18.0	0.0	0.1	0.1	0.9	1.2	1.8	2.8	3.3	4.4	6.0	8.5	13.7	22.8	114.4

DATE TIME	SAMPLE DEPTH	CUMU-LATIVE VOLUME	CUMU-LATIVE COUNT x 10^{-3}	Counts x 10^{-2} Channel Number and Equivalent Spherical Diameter μ													
				0	1	2	3	4	5	6	7	8	9	10	11	12	13
				(32.0)	(25.4)	(20.2)	(16.0)	(12.7)	(10.08)	(8.00)	(6.35)	(5.04)	(4.00)	(3.17)	(2.52)	(2.00)	(1.59)
				STATION													
				A-3													
29	5	373	71.6	0.2	0.7	2.3	6.7	14.6	11.7	12.0	12.1	15.7	21.4	26.2	40.6	82.0	469.5
April	10	455	55.9	0.2	0.5	3.0	9.3	16.7	18.1	15.7	14.4	16.6	20.8	22.7	34.4	64.1	322.6
1500	20	280	35.9	0.1	0.4	1.7	5.8	11.0	11.2	8.1	8.8	11.2	13.6	15.8	24.6	45.6	201.5
	35	67	18.9	0.0	0.1	0.5	1.1	1.7	2.6	4.1	5.9	6.0	8.4	11.0	13.9	21.9	112.4
	50	21	18.0	0.0	0.0	0.0	0.2	0.4	0.9	1.7	2.5	3.9	6.0	8.3	12.6	23.8	119.1
	60	29	15.2	0.0	0.0	0.0	0.2	0.7	1.7	2.5	3.9	4.6	6.9	9.9	13.0	18.3	90.0
	75	41	23.9	0.0	0.0	0.2	0.6	1.2	1.5	2.4	3.7	4.8	6.7	8.4	11.3	20.6	177.8
				A-4													
29	0	238	38.4	0.1	0.1	0.7	3.9	13.5	13.0	7.9	8.6	12.1	15.8	19.3	28.0	49.4	211.7
April	5	194	35.4	0.1	0.2	0.6	3.3	10.0	9.0	6.5	8.3	11.9	17.0	20.8	26.9	45.2	194.7
1615	10	183	38.1	0.1	0.2	0.6	3.8	9.2	6.5	6.2	7.8	11.3	16.8	22.2	29.8	51.6	214.8
	15	155	33.6	0.1	0.2	0.4	2.1	8.8	8.1	5.7	6.5	9.6	14.6	18.4	25.8	44.1	191.9
	25	165	37.7	0.0	0.0	0.3	2.1	8.5	12.8	8.5	8.3	11.6	16.9	20.5	25.9	50.7	211.0
	40	160	31.8	0.1	0.1	0.5	2.3	8.0	10.1	6.7	7.2	10.3	15.0	18.2	23.8	43.3	172.3
	55	25	16.9	0.0	0.0	0.1	0.1	0.5	1.1	2.8	4.6	5.6	7.6	10.7	16.2	22.2	97.9
	70	94	26.3	0.0	0.1	0.3	1.1	4.5	5.3	4.8	6.5	9.2	11.7	15.3	21.0	33.8	149.3

DATE TIME	SAMPLE DEPTH	CUMU-LATIVE VOLUME	CUMU-LATIVE COUNT x 10^{-3}	Counts x 10^{-2} Channel Number and Equivalent Spherical Diameter μ 0 (32.0)	1 (25.4)	2 (20.2)	3 (16.0)	4 (12.7)	5 (10.08)	6 (8.00)	7 (6.35)	8 (5.04)	9 (4.00)	10 (3.17)	11 (2.52)	12 (2.00)	13 (1.59)
								STATION									
								A-5									
29 April 1800	0	293	102.8	0.1	0.2	0.7	4.0	16.6	16.2	10.0	12.3	17.7	23.1	28.9	46.0	97.4	755.2
	5	270	45.7	0.1	0.2	0.7	4.0	16.7	13.0	8.9	10.0	14.9	19.6	24.2	34.8	63.6	246.4
	10	209	31.1	0.1	0.2	0.4	3.4	13.1	9.8	7.4	8.2	10.4	14.2	17.7	20.8	35.2	170.1
	20	140	32.5	0.1	0.2	0.3	1.7	6.9	7.4	6.5	8.4	10.7	15.2	18.2	23.9	38.7	186.9
	30	50	17.5	0.0	0.0	0.1	0.3	2.0	4.1	4.3	4.1	5.7	7.4	9.1	12.6	19.4	106.1
	35	33	18.7	0.0	0.1	0.1	0.4	0.9	1.4	2.0	2.7	3.6	5.3	7.9	11.2	19.2	132.6
	50	36	11.9	0.0	0.1	0.2	0.4	0.8	1.4	2.4	3.4	4.2	5.5	6.7	7.8	11.5	74.2
	70	52	20.5	0.0	0.1	0.2	0.5	0.9	2.5	3.9	5.2	6.6	7.8	10.4	15.0	24.2	128.0
								A-6									
29 April 1945	0	333	61.4	0.2	0.1	0.5	3.6	20.4	23.3	12.8	13.7	18.6	25.8	31.4	47.0	89.2	327.5
	10	309	60.2	0.1	0.2	0.5	3.8	21.4	17.4	9.4	10.9	15.8	23.9	28.9	42.6	79.2	348.5
	25	157	38.7	0.0	0.1	0.4	1.9	8.1	9.9	8.0	9.6	13.3	18.1	22.7	31.4	56.7	207.4
	35	19	11.2	0.0	0.0	0.1	0.1	0.4	0.8	1.7	2.6	3.4	5.0	6.0	8.4	11.2	72.6
	60	22	17.3	0.0	0.0	0.1	0.1	0.4	1.2	2.0	3.1	5.2	7.2	11.0	16.5	24.4	101.9
	80	24	13.9	0.0	0.0	0.1	0.1	0.5	0.9	1.7	3.0	3.9	5.8	8.3	11.7	18.5	84.2
	100	25	14.1	0.0	0.0	0.1	0.3	0.6	1.2	2.1	2.7	3.6	4.9	6.6	10.1	17.1	91.5

DATE TIME	SAMPLE DEPTH	CUMU-LATIVE VOLUME	CUMU-LATIVE COUNT x 10^{-3}	Counts x 10^{-2} Channel Number and Equivalent Spherical Diameter μ 0 (32.0)	1 (25.4)	2 (20.2)	3 (16.0)	4 (12.7)	5 (10.08)	6 (8.00)	7 (6.35)	8 (5.04)	9 (4.00)	10 (3.17)	11 (2.52)	12 (2.00)	13 (1.59)
								STATION									
								A-7									
29	0	301	11.7	0.1	0.1	0.4	3.7	15.4	24.0	17.0	12.3	17.0	22.6	27.3	45.1	104.8	879.3
April	5	319	55.5	0.1	0.1	0.4	0.4	21.6	21.0	10.5	11.8	17.3	22.3	26.9	42.1	78.9	298.5
2200	12	301	56.8	0.2	0.2	0.5	5.3	18.1	13.1	8.2	11.7	17.6	25.1	33.2	46.5	81.3	307.4
	25	207	45.2	0.1	0.1	0.5	2.0	10.7	14.2	11.2	10.6	14.0	19.0	24.9	36.3	63.5	245.3
	35	49	18.8	0.1	0.0	0.1	0.5	1.4	3.0	4.0	4.8	5.3	6.6	8.8	12.2	23.1	118.0
	50	31	17.8	0.0	0.1	0.1	0.2	0.4	1.4	2.1	3.4	5.1	6.9	9.4	12.2	20.9	115.3
	65	38	22.7	0.0	0.1	0.1	0.4	0.7	1.6	2.9	4.5	6.1	8.9	12.7	18.2	28.0	142.5
								A-8									
29	0	309	74.2	0.1	0.2	0.7	5.0	16.0	18.8	10.3	10.8	18.3	23.9	22.8	35.0	74.1	506.2
April	5	312	40.8	0.2	0.4	1.1	6.2	15.9	12.1	6.9	7.3	13.9	20.1	18.2	26.1	51.1	228.7
2330	10	305	42.4	0.3	0.3	1.2	5.3	14.2	12.7	8.7	9.3	14.3	19.3	20.5	29.1	54.1	235.1
	25	210	46.4	0.1	0.1	0.3	2.2	11.9	15.2	9.5	10.4	14.4	19.7	23.9	36.2	68.4	252.2
	30	96	22.8	0.1	0.2	0.4	0.8	3.5	4.7	5.0	5.6	6.8	9.1	11.3	17.5	29.3	134.0
	45	38	18.6	0.0	0.1	0.1	0.2	0.8	1.5	3.0	5.1	7.2	10.3	12.7	16.8	23.9	104.4
								A-9									
30	5	364	67.1	0.1	0.3	0.7	4.4	19.8	27.0	15.7	13.7	18.0	23.2	27.3	44.2	90.7	385.4
April	10	336	61.0	0.0	0.2	0.9	4.8	18.7	20.3	11.3	10.8	18.9	29.9	27.3	37.7	77.6	351.8
0100	20	156	32.8	0.1	0.1	0.3	2.0	7.6	11.0	5.9	5.9	8.8	10.9	12.1	16.2	33.9	213.8
	30	35	43.1	0.0	0.0	0.1	0.2	0.6	1.4	2.6	4.0	6.6	9.6	15.4	37.1	83.7	269.3

DATE TIME	SAMPLE DEPTH	CUMU-LATIVE VOLUME	CUMU-LATIVE COUNT x 10^{-3}	Counts x 10^{-2} Channel Number and Equivalent Spherical Diameter μ 0 (32.0)	1 (25.4)	2 (20.2)	3 (16.0)	4 (12.7)	5 (10.08)	6 (8.00)	7 (6.35)	8 (5.04)	9 (4.00)	10 (3.17)	11 (2.52)	12 (2.00)	13 (1.59)
STATION																	
A-10																	
30	0	550	205.5	0.2	0.3	0.7	3.1	20.8	48.8	44.5	40.2	53.1	72.7	100.0	170.8	334.2	1165.3
April	9	438	131.5	0.1	0.1	0.6	3.2	21.4	36.7	27.3	24.5	38.0	51.5	67.8	118.1	222.3	703.7
0200	19	130	31.0	0.1	0.1	0.4	2.6	6.6	4.6	5.0	6.2	7.1	8.1	9.8	13.0	29.8	217.5
	21	83	21.3	0.0	0.1	0.3	1.8	3.2	4.4	4.3	4.1	3.5	4.2	5.5	8.3	15.4	157.7
A-11																	
30	0	542	133.8	0.2	0.2	1.0	6.5	28.0	37.8	28.0	26.3	36.8	47.9	64.3	114.5	214.3	732.4
April	5	477	137.4	0.3	0.3	1.0	5.2	17.2	36.3	36.4	24.5	34.6	45.3	58.5	107.1	212.7	794.7
0320	10	454	117.0	0.2	0.3	1.2	6.0	20.9	28.9	21.5	21.2	31.5	43.2	57.3	97.5	196.4	643.7
	15	419	91.1	0.2	0.3	0.8	5.2	17.5	33.1	28.4	18.1	25.6	33.0	41.4	73.7	151.7	482.4
	17	386	86.7	0.2	0.2	0.8	4.8	15.9	28.6	26.1	17.0	25.3	33.9	40.5	71.1	141.4	460.8
A-12																	
30	0	447	108.4	0.1	0.2	1.0	4.8	24.5	33.4	18.4	18.5	26.9	40.3	54.4	86.1	169.2	605.8
April	3	371	135.7	0.2	0.1	1.0	4.7	16.4	25.8	17.5	16.0	27.1	37.8	48.5	82.2	174.1	905.3
0430	6	478	94.4	0.2	0.4	1.4	4.9	23.2	34.5	22.2	20.1	28.0	35.0	43.2	68.7	148.0	514.6
	9	478	106.9	0.1	0.2	1.1	6.4	20.7	36.5	32.3	20.7	30.9	38.3	46.5	77.3	161.6	596.1
	12	428	89.5	0.1	0.2	0.9	5.5	18.3	33.7	30.8	18.3	25.0	31.4	38.0	64.9	135.5	492.1

DATE TIME	SAMPLE DEPTH	CUMU-LATIVE VOLUME	CUMU-LATIVE COUNT x 10^{-3}	0 (32.0)	1 (25.4)	2 (20.2)	3 (16.0)	4 (12.7)	5 (10.08)	6 (8.00)	7 (6.35)	8 (5.04)	9 (4.00)	10 (3.17)	11 (2.52)	12 (2.00)	13 (1.59)
				Counts x 10^{-2} — Channel Number and Equivalent Spherical Diameter μ													
				STATION													
				B-1													
30	0	531	141.9	0.1	0.2	1.2	7.3	27.5	34.3	23.1	25.5	41.2	53.7	77.6	120.1	211.5	795.5
April	3	430	129.1	0.2	0.2	0.8	5.1	25.2	27.5	14.1	17.2	27.8	40.3	55.8	93.4	170.9	813.0
0600	9	373	72.1	0.2	0.2	1.0	7.0	17.6	19.7	12.2	13.4	21.4	27.2	33.3	56.2	110.0	401.1
				B-2													
30	0	446	76.6	0.2	0.4	1.7	8.2	20.2	23.1	18.5	15.6	23.1	28.6	29.8	45.8	102.9	448.0
April	5	397	65.4	0.2	0.3	1.4	6.9	17.9	22.3	16.5	14.0	21.3	26.2	26.4	43.8	96.4	360.6
0700	10	408	70.5	0.1	0.5	1.5	6.0	20.3	23.1	14.2	14.4	21.3	27.5	32.3	50.4	99.8	393.7
	15	319	91.0	0.1	0.2	0.9	4.7	14.7	22.1	14.3	14.4	18.4	26.6	35.4	54.1	107.9	596.6
	20	87	20.6	0.1	0.1	0.4	1.2	3.1	4.9	4.7	5.4	6.2	7.4	9.2	12.1	20.1	131.1
				B-3													
30	0	325	66.5	0.2	0.1	0.8	5.3	19.1	16.0	9.0	10.8	18.8	26.6	33.7	51.1	97.3	376.5
April	5	327	62.8	0.2	0.3	0.8	4.9	18.0	16.7	9.6	11.4	19.3	24.5	31.5	49.0	93.7	348.3
0745	10	234	68.9	0.0	0.2	0.5	2.5	11.0	15.3	12.1	14.5	22.4	30.9	43.3	61.4	104.1	370.5
	20	238	71.5	0.0	0.1	0.5	3.5	12.3	14.0	10.7	13.2	20.1	28.8	32.3	58.8	103.5	411.0

DATE TIME	SAMPLE DEPTH	CUMU- LATIVE VOLUME	CUMU- LATIVE COUNT x 10^{-3}	0 (32.0)	1 (25.4)	2 (20.2)	3 (16.0)	4 (12.7)	5 (10.08)	6 (8.00)	7 (6.35)	8 (5.04)	9 (4.00)	10 (3.17)	11 (2.52)	12 (2.00)	13 (1.59)
				Counts x 10^{-2} — Channel Number and Equivalent Spherical Diameter μ													
				STATION B-4													
30	0	319	77.8	0.1	0.2	0.7	5.1	15.5	18.7	14.4	14.5	21.1	30.7	41.5	65.7	118.0	433.0
April	20	148	52.0	0.1	0.0	0.2	1.1	5.7	12.4	11.6	11.3	16.2	22.6	31.1	47.1	77.8	282.5
0830	30	103	34.8	0.0	0.0	0.2	0.7	4.0	8.7	8.1	8.1	9.6	11.8	15.8	22.9	39.4	218.6
	40	42	24.8	0.0	0.0	0.2	0.4	0.9	2.3	3.4	5.1	6.5	11.3	14.2	28.3	28.5	146.7
	50	64	27.1	0.1	0.0	0.2	0.6	1.8	3.5	5.0	7.5	8.9	12.6	16.0	23.3	32.0	159.1
	60	23	17.6	0.0	0.0	0.1	0.2	0.4	1.3	2.3	3.3	4.6	7.0	8.6	11.0	16.0	121.2
				B-5													
30	0	73	15.8	0.0	0.1	0.2	1.1	2.4	3.2	8.5	4.5	3.1	3.8	4.7	6.2	12.3	108.4
April	10	38	14.9	0.0	0.0	0.1	0.4	1.8	2.6	2.7	3.1	3.5	3.4	3.9	5.0	7.9	114.1
1000	25	41	17.0	0.0	0.1	0.1	0.4	1.0	1.9	3.5	5.5	7.1	8.0	9.3	11.8	15.8	105.8
	40	57	27.4	0.0	0.1	0.1	0.4	1.2	2.9	4.5	7.6	10.5	14.4	19.4	26.0	34.9	152.7
	50	52	20.3	0.0	0.1	0.2	0.7	1.3	2.4	4.4	5.7	7.1	9.1	10.9	15.4	22.8	123.5
	60	50	24.0	0.0	0.0	0.2	0.4	1.0	2.2	4.6	6.7	9.1	11.5	15.3	19.3	27.5	142.5
	80	50	21.2	0.0	0.1	0.1	0.6	1.1	2.6	3.5	5.4	7.3	8.9	11.0	13.1	18.0	140.3

Counts x 10^{-2}

DATE TIME	SAMPLE DEPTH	CUMU-LATIVE VOLUME	CUMU-LATIVE COUNT x 10^{-3}	Channel Number and Equivalent Spherical Diameter μ													
				0	1	2	3	4	5	6	7	8	9	10	11	12	13
				(32.0)	(25.4)	(20.2)	(16.0)	(12.7)	(10.08)	(8.00)	(6.35)	(5.04)	(4.00)	(3.17)	(2.52)	(2.00)	(1.59)
								STATION									
								B-6									
30	0	237	48.1	0.1	0.2	0.6	2.1	7.3	20.4	23.9	12.3	15.7	19.7	24.1	32.4	59.7	262.6
April	10	166	29.0	0.0	0.2	0.5	2.2	5.8	11.0	19.5	7.1	7.3	9.3	11.7	15.0	27.5	173.6
1100	25	24	11.3	0.1	0.0	0.1	0.2	0.5	1.1	1.3	1.7	2.1	2.8	3.9	4.9	9.0	85.7
	40	38	21.8	0.0	0.0	0.1	0.4	0.9	1.9	3.5	5.4	7.0	9.1	12.7	17.5	26.2	133.7
	60	37	12.5	0.1	0.1	0.2	0.5	0.9	1.3	2.2	2.4	3.6	4.1	4.9	7.7	10.9	86.7
	80	51	27.3	0.0	0.1	0.1	0.5	0.8	2.1	3.7	6.9	9.8	13.9	19.0	22.2	30.4	163.7
								B-7									
30	0	251	64.8	0.1	0.3	1.0	3.0	8.2	18.6	16.1	14.1	16.5	21.1	27.0	36.7	72.4	413.0
April	6	243	47.8	0.1	0.3	0.9	2.6	8.2	18.9	17.0	12.4	16.4	20.7	24.7	34.2	61.2	260.2
1245	18	196	43.5	0.1	0.2	0.6	2.5	7.0	12.8	18.2	11.2	14.0	17.2	20.5	29.1	52.5	249.1
	30	105	44.1	0.0	0.1	0.2	0.8	2.2	5.7	14.1	15.2	14.3	18.6	24.1	33.5	52.9	259.4
	40	61	24.0	0.0	0.0	0.2	0.6	1.6	3.8	7.3	6.6	7.3	8.4	11.4	14.7	25.7	152.2
	60	21	12.1	0.1	0.0	0.1	0.2	0.3	0.7	1.2	1.5	2.1	2.8	3.3	4.8	8.7	95.1
	95	26	17.7	0.0	0.0	0.1	0.2	0.5	1.2	2.4	4.0	5.7	8.1	10.7	13.1	19.2	111.7

DATE TIME	SAMPLE DEPTH	CUMU-LATIVE VOLUME	CUMU-LATIVE COUNT x 10^{-3}	Counts x 10^{-2} Channel Number and Equivalent Spherical Diameter μ 0 (32.0)	1 (25.4)	2 (20.2)	3 (16.0)	4 (12.7)	5 (10.08)	6 (8.00)	7 (6.35)	8 (5.04)	9 (4.00)	10 (3.17)	11 (2.52)	12 (2.00)	13 (1.59)
				STATION													
				B-8													
30	0	256	43.8	0.1	0.2	0.7	2.9	10.3	22.3	15.2	11.2	13.6	17.8	19.4	29.4	55.1	240.3
April	5	219	38.1	0.0	0.2	0.5	3.3	9.9	12.8	17.6	10.0	11.8	15.2	17.6	22.3	42.2	217.9
1500	15	230	63.8	0.1	0.2	0.7	3.7	9.7	11.1	14.8	12.8	17.0	22.8	30.6	48.5	86.8	378.8
	30	138	36.3	0.0	0.1	0.4	1.2	5.4	10.4	14.1	10.8	12.4	16.4	19.9	25.1	42.1	204.8
	40	94	20.1	0.1	0.1	0.2	1.0	3.2	5.3	7.7	7.1	9.2	9.6	10.1	12.4	19.9	115.3
	55	39	16.7	0.0	0.1	0.1	0.4	1.0	1.8	2.9	4.1	5.1	6.0	7.3	10.0	13.9	114.5
	75	36	20.7	0.0	0.1	0.1	0.2	0.8	1.6	2.6	4.4	6.1	8.8	11.1	14.4	23.4	133.1
	100	35	25.9	0.0	0.0	0.1	0.3	0.7	1.6	2.7	3.8	5.7	8.2	11.2	15.5	22.2	187.2
				B-9													
30	0	251	60.2	0.1	0.2	0.6	2.4	9.9	21.4	17.8	11.4	13.4	17.7	20.9	32.3	63.2	391.1
April	5	236	35.6	0.1	0.1	0.6	3.2	10.6	18.6	13.0	8.4	9.9	11.5	12.2	17.3	38.5	212.3
1645	10	66	155.2	0.0	0.1	0.3	0.8	1.9	2.1	1.0	1.0	2.5	3.7	3.9	7.9	79.8	1447.4
	20	209	31.5	0.0	0.1	0.6	3.0	11.2	14.4	9.1	8.5	10.3	13.3	14.8	16.5	33.3	179.8
	30	156	24.5	0.1	0.1	0.5	2.3	9.0	7.9	7.0	5.4	6.0	8.5	9.8	10.6	20.1	157.3
	50	32	22.6	0.0	0.0	0.1	0.3	0.7	1.5	2.8	3.3	4.1	7.1	9.4	13.4	20.9	162.3
	80	23	31.6	0.0	0.0	0.0	0.2	0.5	1.1	2.0	3.0	4.3	7.1	10.0	19.5	48.5	219.5
	100	29	16.4	0.0	0.0	0.1	0.4	0.7	1.2	1.9	2.4	3.6	5.5	8.1	11.6	17.6	110.5

DATE TIME	SAMPLE DEPTH	CUMU- LATIVE VOLUME	CUMU- LATIVE COUNT x 10^{-3}	Counts x 10^{-2} Channel Number and Equivalent Spherical Diameter μ 0 (32.0)	1 (25.4)	2 (20.2)	3 (16.0)	4 (12.7)	5 (10.08)	6 (8.00)	7 (6.35)	8 (5.04)	9 (4.00)	10 (3.17)	11 (2.52)	12 (2.00)	13 (1.59)
								STATION									
								B-10									
30	0	252	48.7	0.1	0.3	0.8	3.6	11.0	14.3	11.2	12.1	18.9	24.0	27.3	38.5	69.0	255.7
April	20	193	39.9	0.0	0.1	0.6	2.2	8.7	14.2	13.7	10.4	13.1	20.5	22.6	27.0	49.5	216.3
1900	40	93	20.7	0.0	0.0	0.3	1.2	5.3	6.3	3.9	3.1	4.2	5.9	7.4	10.0	17.3	142.1
	60	14	10.8	0.0	0.0	0.1	0.2	0.3	0.8	1.3	2.0	2.3	3.3	4.2	6.1	10.0	77.0
	80	45	17.2	0.1	0.0	0.2	0.3	0.8	1.7	3.2	4.8	5.8	7.9	9.1	12.8	20.5	105.1
	100	9	10.2	0.0	0.0	0.0	0.0	0.3	0.6	0.8	1.6	1.9	2.9	4.2	5.6	8.1	75.6
								B-11									
30	0	317	62.5	0.1	0.3	1.1	5.3	16.0	15.0	13.8	12.2	18.3	27.8	27.1	37.1	79.9	370.9
April	10	315	49.5	0.1	0.2	1.0	4.5	14.2	19.7	19.4	12.7	17.0	26.3	22.5	28.4	63.5	265.6
2000	50	16	9.3	0.0	0.1	0.0	0.2	0.4	0.6	1.0	1.3	2.0	2.5	3.2	4.6	7.4	69.9
	65	32	15.2	0.0	0.0	0.1	0.3	0.7	1.5	2.4	3.3	4.9	6.4	8.0	11.2	17.4	95.6
	90	20	10.0	0.0	0.0	0.1	0.2	0.3	0.7	1.2	1.8	2.8	3.9	5.1	6.5	9.9	67.8
								B-12									
30	0	458	55.5	0.2	0.5	2.1	8.1	21.0	23.6	15.1	12.0	15.9	22.0	25.9	37.1	71.2	300.7
April	10	365	77.1	0.2	0.2	1.1	5.9	17.4	22.0	17.2	12.3	14.4	22.3	22.9	33.7	72.3	529.8
2115	30	20	11.6	0.0	0.0	0.1	0.2	0.4	0.9	1.7	2.3	2.9	3.8	5.5	7.9	12.4	78.4
	75	22	14.6	0.0	0.0	0.1	0.3	0.6	0.7	1.5	2.5	3.7	5.3	7.6	11.5	18.1	94.7
	90	31	12.5	0.0	0.0	0.2	0.5	0.6	1.1	1.6	1.8	2.9	4.0	5.3	8.2	13.0	85.5

DATE TIME	SAMPLE DEPTH	CUMU-LATIVE VOLUME	CUMU-LATIVE COUNT x 10^{-3}	Counts x 10^{-2} Channel Number and Equivalent Spherical Diameter μ 0 (32.0)	1 (25.4)	2 (20.2)	3 (16.0)	4 (12.7)	5 (10.08)	6 (8.00)	7 (6.35)	8 (5.04)	9 (4.00)	10 (3.17)	11 (2.52)	12 (2.00)	13 (1.59)
								STATION									
								B-13									
30	0	428	52.0	0.2	0.3	1.6	7.4	22.4	20.8	15.0	12.0	14.7	23.1	22.7	31.3	57.8	291.0
April	20	35	14.5	0.0	0.0	0.2	0.5	1.2	1.4	2.1	2.7	3.4	4.4	6.3	8.7	13.8	100.2
2215	40	41	16.8	0.1	0.1	0.1	0.4	0.8	1.2	2.1	2.8	4.0	6.6	9.1	13.5	21.5	105.9
								C-1									
30	0	563	73.8	0.2	0.4	1.7	10.3	22.9	31.2	40.1	34.0	24.2	23.5	22.8	44.4	94.4	388.1
April	15	119	88.9	0.1	0.1	0.4	1.5	3.6	5.2	6.8	7.6	10.6	16.7	24.7	42.7	92.9	676.3
2350	30	30	16.9	0.0	0.1	0.1	0.3	0.5	1.3	2.6	4.3	5.1	6.7	8.8	12.0	18.0	109.0
	60	22	14.7	0.1	0.0	0.1	0.2	0.3	0.6	0.9	1.3	2.6	3.4	5.1	7.2	13.1	112.6
	90	15	10.8	0.0	0.0	0.1	0.1	0.2	0.4	0.8	1.0	1.9	2.8	4.5	7.6	11.5	77.4
								C-2									
1 May	0	308	70.9	0.1	0.3	0.9	5.3	11.6	17.5	22.2	19.3	13.0	18.7	22.1	43.3	100.8	434.0
0145	3	289	67.6	0.2	0.2	0.7	3.9	11.2	18.5	24.1	14.0	14.8	20.9	22.6	44.4	106.6	393.7
	8	255	69.9	0.1	0.1	0.4	3.5	9.6	17.5	26.0	19.9	16.1	20.4	24.0	34.0	86.1	441.8
	12	229	59.3	0.1	0.1	0.8	3.6	8.7	14.7	16.9	11.1	13.1	20.3	25.0	43.8	100.2	335.0
	25	82	28.5	0.0	0.1	0.4	1.3	2.6	3.3	5.9	3.7	5.2	9.1	15.1	12.0	19.3	207.2
	55	51	19.4	0.1	0.1	0.1	0.6	1.3	2.4	3.8	5.2	6.5	9.8	11.2	13.7	22.9	116.6
	75	30	11.6	0.0	0.1	0.1	0.3	0.7	1.4	2.6	4.0	4.5	4.8	5.5	6.8	11.3	74.3
	100	29	10.3	0.0	0.1	0.2	0.4	0.5	0.9	1.5	1.9	2.9	3.5	5.3	5.9	9.8	69.9

				Counts x 10^{-2}													
				Channel Number and Equivalent Spherical Diameter μ													
DATE TIME	SAMPLE DEPTH	CUMU-LATIVE VOLUME	CUMU-LATIVE COUNT x 10^{-3}	0 (32.0)	1 (25.4)	2 (20.2)	3 (16.0)	4 (12.7)	5 (10.08)	6 (8.00)	7 (6.35)	8 (5.04)	9 (4.00)	10 (3.17)	11 (2.52)	12 (2.00)	13 (1.59)
								STATION									
								C-3									
1 May	0	49	18.9	0.1	0.1	0.2	0.4	1.4	1.7	2.1	2.2	3.9	8.2	13.1	12.0	17.9	125.6
0315	15	42	21.5	0.0	0.1	0.2	0.3	1.1	2.1	3.0	3.4	5.4	9.7	15.0	13.5	24.2	136.8
	30	58	25.9	0.1	0.2	0.1	0.4	1.0	2.0	4.4	5.4	7.3	10.0	13.3	18.6	29.5	167.3
	50	55	16.0	0.0	0.0	0.2	0.5	1.7	2.9	5.8	6.4	6.5	7.7	8.3	9.5	15.1	95.1
	90	18	10.2	0.0	0.0	0.1	0.2	0.4	0.9	1.5	2.1	2.8	3.4	4.6	6.7	9.0	70.0
								D-1									
1 May	0	59	20.0	0.1	0.0	0.2	0.5	1.1	2.9	6.3	6.9	8.1	10.6	13.9	13.5	20.6	115.1
0600	10	71	34.2	0.1	0.0	0.3	0.6	1.4	3.4	6.7	9.4	13.4	17.5	23.2	25.0	45.7	195.4
	25	43	23.4	0.0	0.1	0.1	0.4	0.9	2.2	2.7	4.5	7.4	8.0	13.5	14.1	23.5	156.8
	45	16	9.0	0.0	0.0	0.0	0.2	0.5	0.7	1.1	1.2	1.7	1.9	2.7	4.1	7.6	68.1
	60	27	11.1	0.1	0.1	0.1	0.4	0.4	0.7	1.4	2.2	2.5	3.7	4.5	6.7	10.8	77.9
	95	15	11.4	0.0	0.0	0.0	0.1	0.3	0.6	1.2	1.7	2.4	3.3	4.8	7.6	12.4	79.4

DATE TIME	SAMPLE DEPTH	CUMU-LATIVE VOLUME	CUMU-LATIVE COUNT x 10^{-3}	Counts x 10^{-2} Channel Number and Equivalent Spherical Diameter μ 0 (32.0)	1 (25.4)	2 (20.2)	3 (16.0)	4 (12.7)	5 (10.08)	6 (8.00)	7 (6.35)	8 (5.04)	9 (4.00)	10 (3.17)	11 (2.52)	12 (2.00)	13 (1.59)
								STATION									
								D-2									
1 May 0800	0	77	24.9	0.0	0.1	0.3	0.7	1.5	4.3	7.8	9.0	11.7	12.0	15.4	16.9	25.6	143.8
	20	63	31.3	0.0	0.1	0.1	0.6	1.3	3.2	6.6	9.4	13.0	13.6	18.4	23.1	38.2	185.9
	35	31	13.1	0.1	0.0	0.2	0.3	0.8	1.3	1.9	2.5	4.0	4.3	5.1	7.0	13.9	89.7
	60	26	17.9	0.0	0.1	0.2	0.3	0.4	0.8	1.4	2.3	3.8	5.1	8.3	12.1	20.7	123.5
	100	17	11.0	0.0	0.0	0.1	0.1	0.3	0.7	1.0	1.5	2.4	3.1	4.5	7.2	12.3	76.9
								D-3									
1 May 1000	0	44	18.2	0.0	0.0	0.2	0.4	1.1	2.0	3.9	6.3	6.6	7.8	9.9	12.3	19.4	112.8
	40	13	9.5	0.0	0.0	0.1	0.1	0.2	0.5	1.0	1.7	2.2	2.8	4.0	5.4	10.2	66.7
	65	42	12.0	0.0	0.0	0.2	0.6	1.1	1.9	5.1	3.1	2.8	3.6	4.3	5.9	11.2	80.4
	80	42	20.3	0.0	0.1	0.2	0.5	0.8	1.4	4.3	4.0	4.6	6.7	10.0	13.2	22.7	134.7
	100	40	33.5	0.0	0.0	0.2	0.4	1.0	1.8	3.3	3.2	4.5	6.1	8.0	8.5	16.5	281.9
								E-1									
1 May 1130	0	22	22.5	0.0	0.0	0.1	0.2	0.3	0.5	1.2	2.3	3.7	4.8	8.1	10.6	22.9	170.0
	25	45	14.0	0.0	0.0	0.1	0.4	1.1	2.4	6.4	5.5	2.6	4.0	5.8	6.8	10.5	94.1
	50	4	9.8	0.0	0.0	0.0	0.1	0.1	0.1	0.2	0.1	0.3	0.4	0.6	2.0	5.8	88.7
	75	14	12.6	0.0	0.0	0.1	0.2	0.2	0.5	1.0	1.7	2.4	4.0	5.8	8.3	13.5	88.0
	100	8	10.3	0.0	0.0	0.0	0.0	0.2	0.4	0.7	1.2	2.1	3.1	4.3	6.4	11.1	73.6

DATE TIME	SAMPLE DEPTH	CUMU-LATIVE VOLUME	CUMU-LATIVE COUNT x 10^{-3}	Counts x 10^{-2} Channel Number and Equivalent Spherical Diameter μ 0 (32.0)	1 (25.4)	2 (20.2)	3 (16.0)	4 (12.7)	5 (10.08)	6 (8.00)	7 (6.35)	8 (5.04)	9 (4.00)	10 (3.17)	11 (2.52)	12 (2.00)	13 (1.59)
								STATION									
								E-2									
1 May 1330	0	27	23.0	0.0	0.1	0.1	0.1	0.4	1.1	1.8	2.2	4.3	6.1	8.6	8.8	15.7	181.2
	10	37	18.2	0.0	0.1	0.1	0.2	0.6	2.5	3.2	3.1	4.5	6.7	8.7	9.7	18.6	123.7
	15	66	17.7	0.0	0.1	0.2	0.5	1.5	5.6	6.9	3.3	4.6	6.5	8.4	9.9	16.3	113.5
	25	123	34.3	0.0	0.2	0.5	1.5	3.8	7.1	13.1	6.8	8.2	9.6	11.8	16.2	28.7	235.3
	40	87	21.7	0.1	0.1	0.3	1.2	2.1	3.6	8.6	6.7	7.4	8.8	10.3	14.9	24.4	129.0
	80	15	9.8	0.0	0.0	0.0	0.1	0.4	0.7	1.0	1.3	2.3	3.1	4.5	5.8	8.6	69.7
	95	82	20.9	0.0	0.1	0.3	1.2	2.7	3.9	9.0	5.3	4.8	6.0	8.9	12.1	20.4	133.9
								E-3									
1 May 1500	0	128	30.4	0.1	0.2	0.4	1.1	2.6	12.1	13.0	6.4	7.1	8.7	10.6	13.4	21.4	206.8
	10	145	36.5	0.0	0.1	0.4	1.3	5.4	14.4	10.1	8.2	9.2	12.3	15.6	21.7	38.2	228.6
	25	156	33.8	0.1	0.1	0.6	1.9	4.8	12.0	13.7	8.4	8.1	9.4	10.6	16.4	29.5	222.2
	35	110	23.3	0.1	0.2	0.4	1.3	3.4	6.5	9.6	6.0	5.7	5.9	7.2	11.4	19.5	156.3
	55	123	49.0	0.0	0.2	0.4	1.1	2.6	5.7	13.0	14.0	20.0	27.3	36.5	50.0	72.7	246.7
	75	19	30.7	0.0	0.0	0.0	0.1	0.3	0.7	1.1	2.0	2.1	3.4	5.6	13.3	38.0	240.8
	95	21	16.2	0.1	0.0	0.1	0.1	0.3	0.6	0.7	1.4	2.6	3.7	5.6	7.3	11.8	128.4

DATE TIME	SAMPLE DEPTH	CUMU-LATIVE VOLUME	CUMU-LATIVE COUNT x 10^{-3}	Counts x 10^{-2} Channel Number and Equivalent Spherical Diameter μ 0 (32.0)	1 (25.4)	2 (20.2)	3 (16.0)	4 (12.7)	5 (10.08)	6 (8.00)	7 (6.35)	8 (5.04)	9 (4.00)	10 (3.17)	11 (2.52)	12 (2.00)	13 (1.59)
								STATION									
								E-4									
1 May 1700	0	181	39.9	0.0	0.1	0.5	1.9	5.9	13.8	21.6	10.9	12.1	13.8	16.4	23.5	39.1	239.3
	10	224	43.5	0.1	0.3	1.0	3.1	6.4	13.5	22.9	10.0	10.6	11.6	14.7	20.4	36.2	284.0
	35	36	22.1	0.0	0.0	0.1	0.5	0.7	1.5	2.7	3.5	5.5	7.0	10.6	13.3	21.3	154.4
	55	44	18.9	0.0	0.1	0.2	0.5	1.1	1.4	3.2	4.6	5.8	9.3	12.3	17.5	24.4	108.5
	75	50	42.4	0.0	0.0	0.2	0.7	1.2	1.9	2.7	4.1	5.8	9.6	16.0	40.7	89.1	251.8
								E-5									
1 May 1800	0	450	82.0	0.3	0.3	1.4	5.5	21.8	29.0	18.9	18.7	23.8	30.7	42.3	70.6	131.8	425.2
	25	96	30.6	0.0	0.1	0.6	1.1	2.0	3.9	11.7	7.6	7.7	9.5	12.6	19.0	34.7	195.9
	50	24	11.9	0.0	0.1	0.1	0.3	0.6	0.9	1.6	2.4	3.4	4.5	5.2	8.0	11.2	80.8
								E-6									
1 May 1900	0	528	81.9	0.2	0.3	1.8	10.7	22.7	29.2	23.1	19.6	24.7	30.8	35.9	62.3	125.5	432.4
	3	496	131.7	0.2	0.3	1.2	5.2	25.9	38.1	24.0	19.9	26.5	35.1	43.7	67.1	142.5	887.2
	25	58	15.4	0.1	0.1	0.3	0.9	1.4	2.1	5.7	4.0	3.9	4.3	5.9	8.8	15.9	100.5
								E-7									
1 May 2000	0	467	92.7	0.1	0.3	1.0	5.2	27.5	32.1	19.3	18.7	26.7	35.2	49.4	72.7	141.2	497.7
	10	403	87.5	0.1	0.2	1.2	6.6	22.2	21.9	14.1	13.1	19.0	28.2	34.8	56.7	112.7	544.2
	20	101	33.8	0.0	0.1	0.2	0.9	3.2	5.5	9.0	10.4	17.6	17.3	19.1	24.4	39.9	190.2
	30	57	20.2	0.0	0.1	0.2	0.5	1.5	2.9	3.7	4.1	4.8	7.0	10.2	13.7	22.2	131.7

DATE TIME	SAMPLE DEPTH	CUMU-LATIVE VOLUME	CUMU-LATIVE COUNT x 10^{-3}	Counts x 10^{-2} Channel Number and Equivalent Spherical Diameter μ 0 (32.0)	1 (25.4)	2 (20.2)	3 (16.0)	4 (12.7)	5 (10.08)	6 (8.00)	7 (6.35)	8 (5.04)	9 (4.00)	10 (3.17)	11 (2.52)	12 (2.00)	13 (1.59)
								STATION F-1									
1 May 2300	0	548	100.8	0.2	0.2	1.6	7.6	29.5	32.8	21.1	22.0	29.7	41.4	56.6	89.5	161.1	515.0
	10	473	91.1	0.2	0.3	1.5	7.5	23.7	25.6	18.1	19.2	26.4	37.8	52.1	85.1	152.1	461.1
	20	85	22.2	0.1	0.1	0.2	0.9	2.9	4.8	7.6	6.7	7.4	8.4	9.8	14.6	25.0	133.2
	30	37	14.0	0.0	0.0	0.1	0.4	1.2	2.5	2.7	2.9	3.6	4.8	5.4	6.8	11.4	98.5
								F-2									
2 May 0130	0	260	43.2	0.1	0.2	0.7	2.7	6.5	16.9	42.6	20.3	12.2	15.2	18.3	26.2	45.7	224.7
	3	267	40.3	0.1	0.4	0.8	2.5	6.6	21.6	35.3	14.7	12.4	14.1	18.3	23.2	42.9	210.6
	10	272	52.9	0.1	0.4	0.9	2.5	7.4	20.8	32.2	14.1	15.1	18.3	23.2	34.0	57.1	303.3
	14	281	46.8	0.1	0.4	1.2	3.5	7.7	18.5	29.2	13.5	16.5	19.5	22.9	34.4	57.8	242.8
	20	380	73.8	0.2	0.3	1.3	4.6	10.2	20.9	55.1	25.6	19.5	27.3	33.2	39.1	65.8	434.7
	27	168	40.7	0.1	0.2	0.7	2.0	4.1	8.6	17.0	15.1	16.3	20.1	22.3	32.4	50.2	218.1
	35	138	23.8	0.1	0.2	0.7	2.2	4.3	6.4	8.9	8.1	8.8	9.7	11.7	14.7	24.8	137.8
								F-3									
2 May 0300	0	217	43.1	0.1	0.2	0.7	2.0	4.3	14.5	33.3	18.1	12.2	15.6	19.8	28.0	45.9	236.7
	8	171	36.1	0.1	0.2	0.5	1.6	4.6	9.7	24.3	11.2	10.7	14.4	18.4	25.6	41.3	198.7
	20	100	19.6	0.0	0.1	0.4	1.7	2.9	3.0	13.0	9.3	6.4	7.6	9.4	12.3	20.6	109.5
	25	105	20.3	0.1	0.2	0.6	1.4	2.4	4.6	9.8	8.4	9.2	9.0	9.9	13.8	19.4	114.2

DATE TIME	SAMPLE DEPTH	CUMU-LATIVE VOLUME	CUMU-LATIVE COUNT x 10^{-3}	Counts x 10^{-2} Channel Number and Equivalent Spherical Diameter μ 0 (32.0)	1 (25.4)	2 (20.2)	3 (16.0)	4 (12.7)	5 (10.08)	6 (8.00)	7 (6.35)	8 (5.04)	9 (4.00)	10 (3.17)	11 (2.52)	12 (2.00)	13 (1.59)
								STATION									
								G-1									
2 May 0445	0	1516	110.5	10.2	3.3	2.8	3.9	9.7	13.7	27.1	18.5	40.5	58.0	90.9	131.5	179.2	516.1
	5	281	44.6	- -	0.3	1.0	2.3	6.4	21.1	42.5	20.5	12.6	16.0	20.2	26.7	47.7	228.9
	17	150	31.3	0.1	0.3	1.0	2.3	3.1	5.4	17.0	7.9	7.0	8.9	12.6	22.7	42.8	182.2
	25	91	24.6	0.0	0.2	0.4	1.1	2.0	3.8	10.5	7.4	8.8	10.4	12.7	16.6	28.0	144.5
	35	87	26.8	0.0	0.1	0.3	1.3	2.4	4.5	7.9	8.4	9.3	12.3	16.0	23.6	35.5	146.6
								G-2									
2 May 0800	0	118	20.3	0.0	0.2	0.8	2.0	2.6	4.3	15.1	6.6	5.0	5.8	7.0	9.4	16.2	128.2
	15	112	25.9	0.0	0.1	0.6	1.7	3.0	4.0	13.3	8.7	8.3	9.4	12.9	16.1	27.1	153.8
	30	123	28.0	0.1	0.2	0.5	1.6	3.2	5.3	13.5	10.1	11.6	13.2	15.5	19.9	29.5	155.9
	45	24	9.4	0.0	0.0	0.2	0.4	0.5	0.8	1.5	1.7	1.7	2.3	2.6	4.2	6.6	71.2
	60	22	11.8	0.0	0.0	0.1	0.2	0.6	1.2	1.9	2.9	3.7	4.7	5.9	8.4	11.9	77.0
								G-3									
2 May 1000	0	236	63.7	0.1	0.2	0.8	2.4	6.7	18.6	23.4	12.8	17.4	26.2	36.8	57.1	93.9	340.2
	15	187	48.1	0.0	0.2	0.6	2.3	4.9	11.2	24.5	13.4	14.0	15.5	20.5	28.5	47.9	297.7
	30	24	13.7	0.0	0.0	0.1	0.3	0.8	1.0	1.7	2.1	2.3	3.4	5.0	7.9	14.7	97.9
	60	21	14.2	0.0	0.0	0.1	0.2	0.6	0.9	2.0	3.2	4.3	5.4	6.8	9.1	13.1	96.9
	92	43	15.0	0.0	0.1	0.2	0.6	1.0	1.6	2.5	3.4	4.0	5.5	6.8	10.0	17.1	96.7

DATE TIME	SAMPLE DEPTH	CUMU-LATIVE VOLUME	CUMU-LATIVE COUNT x 10^{-3}	Counts x 10^{-2} Channel Number and Equivalent Spherical Diameter μ 0 (32.0)	1 (25.4)	2 (20.2)	3 (16.0)	4 (12.7)	5 (10.08)	6 (8.00)	7 (6.35)	8 (5.04)	9 (4.00)	10 (3.17)	11 (2.52)	12 (2.00)	13 (1.59)
								STATION G-4									
2 May 1115	0	321	53.5	0.2	0.6	1.7	4.6	7.8	15.7	32.6	13.3	16.4	21.6	27.8	41.3	69.8	282.3
	15	203	47.6	0.1	0.2	0.7	2.3	5.0	11.4	29.3	15.0	14.6	19.7	26.2	38.9	62.8	250.0
	35	137	31.0	0.1	0.1	0.4	1.3	3.8	8.2	19.8	11.9	11.6	13.7	16.0	21.8	35.2	165.8
	55	21	34.3	0.0	0.0	0.1	0.2	0.3	0.7	1.0	1.7	2.1	3.9	6.4	12.6	25.5	288.8
	85	19	13.1	0.0	0.0	0.0	0.1	0.5	1.0	1.9	2.8	3.8	5.2	7.7	10.7	16.7	80.4
								G-5									
2 May 2000	0	369	56.9	0.1	0.8	2.0	5.7	8.7	19.4	33.3	12.3	16.4	23.0	30.2	48.7	78.7	289.3
	25	134	23.0	0.1	0.3	0.7	2.1	2.8	4.5	13.0	7.4	7.7	8.5	10.4	14.6	24.1	133.7
	40	250	37.8	0.2	0.2	1.0	3.1	7.7	15.3	28.1	10.0	10.0	10.0	17.1	27.7	44.8	199.1
	80	10	9.2	0.0	0.0	0.0	0.1	0.2	0.4	0.8	1.0	1.3	1.8	2.6	3.1	5.1	75.3
	100	15	12.8	0.0	0.0	0.1	0.2	0.2	0.6	0.5	1.0	1.6	2.1	3.1	3.9	6.6	108.1
								G-6									
2 May 2200	0	289	51.0	0.1	0.3	1.1	2.4	7.0	18.2	39.7	24.6	19.2	23.1	27.2	29.9	50.7	266.9
	10	281	55.9	0.1	0.4	1.0	2.6	6.7	16.0	39.2	28.6	20.6	26.5	29.1	35.7	62.0	290.5
	15	319	45.6	0.2	0.3	1.0	3.3	8.0	19.5	44.2	28.2	17.7	20.5	21.8	24.1	41.4	225.6
	25	215	45.8	0.1	0.3	1.5	3.8	5.7	5.4	15.7	17.9	12.2	15.6	22.1	29.0	48.2	280.9
	75	6	6.6	0	0.0	0.0	0.1	0.1	0.2	0.2	0.4	0.5	0.9	1.4	2.3	3.2	57.1

DATE TIME	SAMPLE DEPTH	CUMU-LATIVE VOLUME	CUMU-LATIVE COUNT x 10^{-3}	0 (32.0)	1 (25.4)	2 (20.2)	3 (16.0)	4 (12.7)	5 (10.08)	6 (8.00)	7 (6.35)	8 (5.04)	9 (4.00)	10 (3.17)	11 (2.52)	12 (2.00)	13 (1.59)
				Counts x 10^{-2} — Channel Number and Equivalent Spherical Diameter μ													
				STATION G-7													
3 May 0100	0	403	48.7	0.3	0.7	3.0	7.4	7.7	10.1	36.8	18.7	14.1	18.1	19.9	25.4	52.6	272.2
	3	268	44.5	0.1	0.3	0.9	3.3	8.6	13.0	27.7	30.2	14.3	18.6	21.9	27.3	48.9	229.5
	10	200	42.9	0.2	0.1	0.3	1.5	4.3	11.3	28.6	30.1	15.0	18.0	22.5	27.8	45.1	223.8
	20	197	38.6	0.1	0.2	0.6	2.2	4.7	11.3	27.0	20.2	11.4	14.7	18.4	25.2	42.4	207.4
	30	61	16.7	0.1	0.1	0.3	0.9	1.7	2.2	4.0	3.7	2.6	3.7	5.0	8.0	15.8	119.0
	45	26	11.5	0.0	0.1	0.1	0.4	0.7	0.8	1.2	1.7	2.5	3.1	4.7	7.1	13.4	79.2
	60	16	9.8	0.0	0.0	0.1	0.2	0.3	0.6	1.1	1.1	1.9	2.5	3.5	5.6	9.2	71.8
	90	13	7.6	0.0	0.0	0.1	0.1	0.2	0.5	0.9	1.0	1.1	1.4	1.8	3.2	6.0	59.7
				H-1													
3 May 0400	0	21	19.6	0.0	0.0	0.1	0.2	0.3	0.4	0.8	1.9	5.5	10.2	10.4	13.0	25.0	128.2
	5	49	10.2	0.1	0.1	0.2	0.4	0.7	0.9	1.6	3.0	8.5	15.7	15.1	18.3	37.5	165.5
	10	24	15.1	0.0	0.0	0.1	0.2	0.3	0.6	1.0	1.7	5.0	8.7	9.8	11.0	16.9	95.2
	18	128	32.0	0.1	0.2	0.4	1.6	3.4	5.5	10.7	9.2	11.4	13.6	17.0	21.0	37.0	189.2
	30	67	8.9	0.0	0.5	0.2	0.7	1.6	4.1	7.0	6.6	7.6	9.7	12.8	14.6	23.6	153.7
	50	75	25.5	0.0	0.1	0.2	0.9	2.3	4.1	7.7	7.1	8.3	10.6	13.0	15.8	28.6	156.2
	60	134	27.5	0.1	0.1	0.5	1.7	4.4	6.5	10.9	9.0	10.5	11.8	12.9	17.8	31.6	157.5
	90	117	25.4	0.1	0.2	0.6	1.7	4.1	4.4	8.2	6.1	6.2	8.5	10.6	14.3	25.7	162.9

DATE TIME	SAMPLE DEPTH	CUMU- LATIVE VOLUME	CUMU- LATIVE COUNT x 10^{-3}	Counts x 10^{-2} Channel Number and Equivalent Spherical Diameter μ 0 (32.0)	1 (25.4)	2 (20.2)	3 (16.0)	4 (12.7)	5 (10.08)	6 (8.00)	7 (6.35)	8 (5.04)	9 (4.00)	10 (3.17)	11 (2.52)	12 (2.00)	13 (1.59)
STATION H-2																	
3 May 0800	0	18	28.2	0.0	0.0	0.1	0.1	0.2	0.3	0.6	1.5	5.7	11.6	9.8	13.9	47.2	191.3
	5	30	76.6	0.0	0.0	0.1	0.2	0.2	0.2	0.9	1.4	6.2	12.6	11.4	14.3	50.9	667.2
	25	18	27.7	0.0	0.0	0.0	0.0	0.2	0.2	0.4	1.3	6.2	12.4	11.7	15.4	42.0	186.8
	50	8	6.3	0.0	0.0	0.0	0.1	0.1	0.2	0.3	0.5	0.9	1.4	1.8	3.2	6.1	48.8
	100	9	12.6	0.0	0.0	0.0	0.1	0.2	0.2	0.5	1.0	2.0	3.6	5.8	10.0	17.5	85.6
I-1																	
3 May 1000	0	14	17.2	0.0	0.1	0.1	0.1	0.1	0.1	0.4	1.1	5.3	8.7	6.4	7.5	16.7	125.2
	10	21	12.8	0.1	0.0	0.1	0.1	0.1	0.2	0.5	0.8	3.0	4.5	4.5	4.6	9.4	99.7
	30	19	6.7	0.0	0.1	0.2	0.2	0.4	0.2	0.4	0.5	0.7	1.8	1.8	2.5	5.9	52.5
	60	9	5.8	0.0	0.0	0.0	0.1	0.1	0.2	0.3	0.5	0.7	1.0	1.6	2.6	4.3	45.9
	100	10	8.4	0.0	0.0	0.0	0.2	0.1	0.2	0.3	0.7	1.3	2.1	3.4	5.6	8.5	61.4
I-2																	
3 May 1100	0	1250	26.0	8.8	4.2	2.4	3.2	4.8	3.8	2.9	3.0	7.2	12.8	14.6	15.2	27.1	150.5
	10	12	16.1	0.0	0.0	0.1	0.1	0.1	0.2	0.4	1.6	5.7	7.7	8.4	8.8	14.9	113.1
	20	5	9.7	0.0	0.0	0.0	0.1	0.1	0.1	0.2	0.3	0.7	1.0	1.9	3.0	5.7	84.3
	45	26	14.1	0.0	0.0	0.2	0.3	0.7	1.0	1.0	1.6	2.4	3.8	5.7	8.8	15.8	100.1
	65	30	9.7	0.1	0.1	0.2	0.4	0.6	0.7	0.8	1.0	1.6	2.6	3.7	5.6	10.3	69.8
	100	20	11.7	0.1	0.0	0.1	0.2	0.4	0.6	1.0	1.2	1.2	1.7	2.3	3.1	7.0	98.8

DATE TIME	SAMPLE DEPTH	CUMU-LATIVE VOLUME	CUMU-LATIVE COUNT x 10^{-3}	Counts x 10^{-2} Channel Number and Equivalent Spherical Diameter μ													
				0	1	2	3	4	5	6	7	8	9	10	11	12	13
				(32.0)	(25.4)	(20.2)	(16.0)	(12.7)	(10.08)	(8.00)	(6.35)	(5.04)	(4.00)	(3.17)	(2.52)	(2.00)	(1.59)
STATION I-3																	
3 May 1200	0	75	31.5	0.0	0.1	0.4	0.9	2.2	3.4	4.8	4.8	7.4	9.2	9.8	12.4	23.0	236.7
	10	91	23.4	0.1	0.1	0.2	1.0	2.3	5.8	7.3	6.7	10.4	12.7	14.7	15.0	25.3	132.2
	20	75	26.5	0.0	0.1	0.3	0.8	2.1	5.2	6.0	6.1	7.1	9.7	11.1	13.7	24.6	178.3
	30	63	24.2	0.0	0.0	0.1	0.5	1.2	4.3	7.9	8.6	7.7	9.4	11.3	12.4	20.5	158.1
	40	62	17.4	0.1	0.1	0.3	0.6	1.6	3.0	5.1	4.9	4.6	5.8	8.0	9.9	20.4	109.5
	50	27	14.6	0.0	0.0	0.2	0.3	0.7	1.3	2.3	2.4	2.8	3.6	4.1	6.1	9.8	112.5
	60	18	9.8	0.0	0.1	0.1	0.2	0.5	0.9	1.4	1.4	1.8	2.6	3.0	3.9	6.6	75.4
	75	17	12.7	0.0	0.0	0.1	0.2	0.3	0.7	1.1	1.6	2.5	3.4	5.1	8.1	13.6	90.4
I-4																	
3 May 1400	0	600	60.1	0.4	1.0	4.0	9.3	14.9	22.0	60.5	21.9	18.5	21.5	28.8	33.4	61.6	303.1
	12	478	70.6	0.3	0.6	1.4	5.8	13.0	27.9	60.1	33.3	24.0	29.6	35.0	40.9	74.5	359.7
	20	220	45.3	0.1	0.3	1.1	3.2	6.1	10.2	22.1	12.7	13.6	18.3	23.6	34.4	61.2	246.5
	30	112	24.9	0.1	0.2	0.5	1.5	3.3	5.8	9.0	6.9	8.1	10.0	11.5	16.5	27.5	148.6
	45	71	12.1	0.0	0.1	0.5	1.5	2.3	2.7	3.7	3.2	3.2	3.9	4.4	6.3	11.7	77.2
	60	50	97.4	0.0	0.0	0.2	0.5	1.1	1.8	2.5	2.9	3.7	6.0	12.4	33.8	127.6	781.8
	80	66	18.4	0.0	0.1	0.4	1.1	1.8	3.1	3.1	3.7	3.8	5.3	6.7	10.1	18.0	127.2

DATE TIME	SAMPLE DEPTH	CUMU-LATIVE VOLUME	CUMU-LATIVE COUNT x 10^{-3}	Counts x 10^{-2} Channel Number and Equivalent Spherical Diameter μ													
				0	1	2	3	4	5	6	7	8	9	10	11	12	13
				(32.0)	(25.4)	(20.2)	(16.0)	(12.7)	(10.08)	(8.00)	(6.35)	(5.04)	(4.00)	(3.17)	(2.52)	(2.00)	(1.59)
STATION I-5																	
3 May 1515	0	509	78.4	0.3	0.8	2.3	5.9	13.4	35.5	46.2	20.0	22.7	30.6	34.9	48.6	91.9	430.8
	4	508	67.6	0.4	0.5	1.8	5.6	14.4	39.8	51.0	20.9	20.9	28.9	32.8	43.6	77.6	337.8
	15	357	53.7	0.2	0.4	2.0	4.9	9.2	20.5	34.7	19.1	16.2	20.3	24.7	33.4	62.8	288.5
	20	204	36.4	0.1	0.2	0.8	2.3	5.7	12.9	23.7	16.5	11.2	13.6	16.7	23.6	41.2	195.7
	25	167	24.7	0.1	0.2	0.9	3.0	5.3	6.7	12.9	8.7	8.4	9.2	11.7	17.1	29.3	133.5
	50	45	15.4	0.0	0.1	0.2	0.5	1.3	2.1	3.7	3.4	3.1	5.5	7.8	10.7	18.1	97.9
	65	101	20.2	0.0	0.2	0.5	1.7	3.9	4.6	6.0	5.4	6.4	7.7	11.0	15.1	25.5	114.3
	80	54	12.6	0.0	0.1	0.2	1.1	1.9	2.0	2.7	2.3	2.4	3.4	4.3	5.9	13.1	86.5
I-6																	
3 May 1645	0	572	65.7	0.3	0.6	3.5	8.8	15.8	23.6	65.4	24.3	18.7	24.0	30.3	38.3	66.7	336.8
	5	503	130.3	0.1	0.7	3.6	9.2	16.6	22.8	28.1	10.7	8.1	10.0	13.9	22.5	75.1	1081.6
	20	281	36.7	0.2	0.4	1.2	3.9	8.5	11.7	27.3	14.7	15.9	16.2	20.6	24.2	38.3	183.5
	35	74	18.9	0.2	0.1	0.2	1.3	2.5	3.4	4.7	4.3	5.3	6.5	8.8	13.0	22.4	116.3
	45	67	14.8	0.1	0.1	0.4	1.1	2.2	2.5	2.7	3.0	4.0	4.9	7.0	11.7	15.8	92.7
	55	26	11.5	0.0	0.1	0.1	0.4	0.8	1.3	1.7	1.8	2.6	3.6	4.9	6.8	12.2	79.0
	60	36	15.6	0.0	0.1	0.2	0.5	1.0	1.2	1.6	1.8	2.7	3.1	4.7	6.5	11.3	121.6
	70	34	11.4	0.0	0.0	0.2	0.5	1.0	1.2	2.0	2.5	3.1	3.3	3.8	5.3	9.1	81.7
	75	24	10.2	0.0	0.0	0.1	0.4	0.7	1.1	1.5	1.9	2.1	2.8	3.5	5.1	8.9	73.7

DATE TIME	SAMPLE DEPTH	CUMU-LATIVE VOLUME	CUMU-LATIVE COUNT x 10^{-3}	Counts x 10^{-2} Channel Number and Equivalent Spherical Diameter μ													
				0	1	2	3	4	5	6	7	8	9	10	11	12	13
				(32.0)	(25.4)	(20.2)	(16.0)	(12.7)	(10.08)	(8.00)	(6.35)	(5.04)	(4.00)	(3.17)	(2.52)	(2.00)	(1.59)
								STATION									
								I-7									
3 May 1800	0	405	66.3	0.1	0.3	0.9	3.0	9.0	43.7	70.1	32.2	16.2	19.9	26.1	35.8	72.8	342.4
	5	346	72.0	0.0	0.3	0.8	2.4	7.0	26.9	69.9	33.7	13.1	17.5	21.1	29.3	66.1	432.0
	15	362	55.1	0.1	0.4	1.4	4.7	13.0	22.3	38.1	16.0	16.8	19.5	24.0	34.8	57.6	30.2
	25	67	30.0	0.0	0.1	0.3	0.8	1.9	2.8	4.1	4.3	5.7	8.2	11.6	21.2	48.5	190.7
	50	27	10.1	0.1	0.1	0.2	0.1	0.4	0.6	1.1	1.1	1.8	2.2	2.5	3.7	6.6	80.6
								I-8									
3 May 1900	0	382	49.1	0.1	0.3	1.6	6.0	16.6	20.0	29.9	14.8	15.2	17.9	23.6	32.8	56.9	255.7
	5	383	63.7	0.1	0.5	1.7	6.6	14.1	18.1	30.1	13.3	17.0	23.3	37.3	60.1	100.1	314.6
	15	79	19.8	0.0	0.1	0.3	1.0	2.9	4.6	6.6	4.8	5.5	7.4	9.0	12.4	22.4	120.7
	20	43	11.1	0.1	0.1	0.1	0.5	1.2	2.0	2.5	2.4	2.6	2.7	3.4	4.0	7.4	82.6
	30	25	10.1	0.0	0.1	0.1	0.3	0.7	1.0	1.4	1.8	1.9	1.9	2.2	2.9	5.2	81.2
	40	22	7.8	0.0	0.0	0.2	0.3	0.6	0.8	1.2	1.4	1.3	1.3	1.6	2.2	3.4	63.5
								I-9									
3 May 2000	0	208	48.1	0.0	0.1	0.6	2.0	6.5	16.7	22.8	14.3	16.9	22.3	28.0	40.8	63.8	246.1
	5	236	55.0	0.1	0.2	0.7	3.6	8.8	13.1	19.7	12.8	12.4	14.6	21.5	49.7	90.8	301.9
	10	213	40.8	0.1	0.2	0.6	2.9	7.1	13.4	19.2	13.7	15.3	17.1	20.0	28.4	45.5	224.9
	20	203	31.8	0.1	0.3	0.9	3.0	6.4	10.1	13.4	11.5	12.6	13.2	16.8	22.3	37.0	170.7

DATE TIME	SAMPLE DEPTH	CUMU-LATIVE VOLUME	CUMU-LATIVE COUNT x 10^{-3}	Counts x 10^{-2} — Channel Number and Equivalent Spherical Diameter μ: 0 (32.0)	1 (25.4)	2 (20.2)	3 (16.0)	4 (12.7)	5 (10.08)	6 (8.00)	7 (6.35)	8 (5.04)	9 (4.00)	10 (3.17)	11 (2.52)	12 (2.00)	13 (1.59)
								STATION									
								J-1									
3 May 2100	0	619	95.3	0.2	0.6	3.3	11.4	22.8	29.8	37.8	18.5	22.0	31.4	47.7	81.4	150.8	495.0
	5	565	75.2	0.2	0.5	1.8	8.3	22.2	36.1	48.9	25.6	24.7	28.5	37.1	54.5	94.0	369.2
	11	470	69.7	0.1	0.3	1.6	6.7	17.6	33.6	43.5	21.4	23.3	25.0	31.3	44.2	75.7	373.3
	22	87	18.6	0.0	0.2	0.3	1.1	2.7	3.8	9.6	7.2	7.3	7.6	8.9	13.0	21.0	103.7
								J-2									
3 May 2200	0	457	51.2	0.2	0.6	3.0	9.5	15.5	15.6	28.7	14.2	15.5	20.0	26.9	35.7	55.4	271.3
	5	500	64.6	0.1	0.6	2.8	8.8	18.8	26.9	29.5	16.3	17.0	21.2	26.7	36.9	64.5	376.1
	15	180	26.5	0.2	0.3	0.8	2.8	5.4	6.0	13.5	8.6	8.7	11.0	14.6	18.3	30.9	143.9
	23	40	11.5	0.0	0.1	0.2	0.5	0.9	1.9	3.9	2.4	2.9	3.0	3.8	5.0	9.0	81.4
	30	38	13.2	0.0	0.1	0.2	0.6	1.2	1.6	2.3	2.0	2.2	2.1	2.9	4.1	8.1	104.7
								J-3									
3 May 2330	0	575	61.0	0.2	0.7	3.2	9.8	17.9	25.9	60.2	18.8	17.6	22.1	28.9	36.5	64.0	304.6
	5	515	63.2	0.4	0.6	1.6	5.7	17.7	35.0	54.0	18.9	19.8	19.3	22.5	33.3	64.2	338.9
	15	233	140.6	0.2	0.3	1.9	4.8	7.4	6.1	4.8	2.7	2.7	2.5	3.5	8.4	48.6	1312.1
	20	148	20.9	0.1	0.2	0.8	2.9	5.4	5.1	8.9	6.0	5.5	6.6	7.5	9.8	16.7	133.3
	29	100	17.2	0.1	0.1	0.6	1.6	2.7	4.9	6.0	6.5	5.7	5.7	6.2	7.5	14.2	110.1
	35	79	14.5	0.1	0.1	0.4	1.4	2.1	2.9	3.3	3.1	2.4	2.4	2.5	4.2	7.7	112.4

DATE TIME	SAMPLE DEPTH	CUMU-LATIVE VOLUME	CUMU-LATIVE COUNT x 10^{-3}	0 (32.0)	1 (25.4)	2 (20.2)	3 (16.0)	4 (12.7)	5 (10.08)	6 (8.00)	7 (6.35)	8 (5.04)	9 (4.00)	10 (3.17)	11 (2.52)	12 (2.00)	13 (1.59)
				Counts x 10^{-2} — Channel Number and Equivalent Spherical Diameter μ													
STATION																	
J-4																	
4 May 0100	0	339	56.3	0.1	0.5	1.7	5.2	10.8	16.7	23.5	19.8	21.7	26.8	34.0	47.3	78.2	276.5
	4	200	60.8	0.1	0.1	0.4	2.5	6.9	11.5	19.5	15.5	20.5	26.4	34.8	48.8	78.5	342.1
	12	298	53.1	0.1	0.4	1.4	5.0	10.3	11.3	22.3	16.5	19.4	26.4	32.8	41.9	69.1	274.5
	16	183	37.1	0.1	0.3	0.6	2.3	5.2	9.9	17.0	10.9	11.4	15.5	19.3	26.4	45.2	207.2
	25	44	11.8	0.0	0.1	0.3	0.6	1.0	1.4	2.2	2.4	2.8	2.5	4.0	5.5	10.1	84.9
	29	35	9.2	0.0	0.1	0.3	0.6	1.0	1.3	2.0	2.3	2.0	2.7	2.9	4.3	7.5	65.4
K-1																	
4 May 0200	0	637	133.3	0.2	0.4	1.5	6.4	22.7	49.3	66.8	36.4	40.2	44.2	57.4	80.1	145.7	781.7
	5	522	81.9	0.1	0.3	1.5	6.0	18.8	38.8	58.5	29.1	28.6	32.6	41.5	55.9	99.1	408.0
	15	253	42.0	0.1	0.4	0.8	3.0	8.4	13.1	27.6	17.0	11.4	15.0	21.0	30.0	40.1	231.7
	20	101	19.9	0.1	0.1	0.3	1.2	3.3	5.1	11.3	7.4	5.9	7.5	10.2	14.3	21.6	110.76
	25	39	17.1	0.0	0.1	0.1	0.5	0.9	1.6	3.8	4.0	5.0	6.6	8.3	10.7	16.9	113.1
	35	124	24.8	0.1	0.2	0.7	2.0	3.1	4.8	6.6	8.8	9.4	11.4	13.4	16.3	27.3	143.6
K-2																	
4 May 0335	0	490	105.3	0.2	0.3	0.6	3.4	10.4	33.7	85.4	65.4	43.2	59.2	65.7	73.2	122.6	489.8
	5	671	153.6	0.1	0.3	2.5	10.4	27.6	34.9	65.1	30.7	30.2	36.2	53.0	69.5	130.9	1044.3
	12	393	50.7	0.1	0.4	1.7	6.5	13.7	19.3	39.4	15.4	14.6	16.7	19.5	27.6	48.7	283.2
	27	35	11.5	0.0	0.1	0.3	0.4	0.8	1.5	1.9	2.8	3.3	4.0	5.1	6.7	10.9	77.8
	40	53	14.9	0.0	0.1	0.3	1.1	1.4	2.1	2.3	3.9	4.9	6.7	8.4	10.5	16.0	91.8

DATE TIME	SAMPLE DEPTH	CUMU-LATIVE VOLUME	CUMU-LATIVE COUNT x 10^{-3}	0 (32.0)	1 (25.4)	2 (20.2)	3 (16.0)	4 (12.7)	5 (10.08)	6 (8.00)	7 (6.35)	8 (5.04)	9 (4.00)	10 (3.17)	11 (2.52)	12 (2.00)	13 (1.59)
				Counts x 10^{-2}													
				Channel Number and Equivalent Spherical Diameter μ													
				STATION													
				K-3													
4 May 0435	0	750	75.2	0.3	0.8	3.2	12.9	26.9	35.9	71.1	26.3	25.7	26.8	32.6	44.2	76.1	369.6
	3	628	68.3	0.3	0.5	2.2	9.8	23.6	32.4	66.8	26.3	23.9	24.8	30.9	38.5	70.0	332.6
	19	222	34.0	0.0	0.1	0.9	2.6	7.7	13.8	26.8	15.8	10.6	12.8	16.6	23.5	35.3	173.0
	24	109	21.1	0.1	0.1	0.4	1.8	3.6	3.8	8.7	7.2	7.0	8.4	10.5	15.2	23.6	121.0
	29	69	16.8	0.0	0.2	0.3	1.0	2.1	2.7	3.7	5.3	5.7	6.6	8.3	10.6	16.8	104.4
	44	146	22.2	0.1	0.2	0.9	3.0	4.4	5.2	6.9	7.2	7.5	8.1	9.9	13.5	23.7	131.3
				K-4													
4 May 0530	0	336	188.2	0.1	0.2	0.7	2.8	7.5	21.5	51.3	37.7	23.8	30.1	35.5	45.0	125.9	1499.9
	5	375	67.2	- -	- -	0.9	4.0	- -	- -	54.9	34.8	24.9	27.2	33.1	39.7	67.9	352.3
	12	256	171.9	0.3	0.4	1.3	3.3	5.4	9.7	16.2	10.3	9.3	13.7	41.1	141.6	333.3	1132.8
	29	133	33.0	0.1	0.1	0.7	2.2	4.6	5.3	9.5	6.3	7.1	8.8	11.3	18.4	31.3	224.0
	44	134	21.2	0.1	0.2	0.6	2.5	4.0	5.2	7.8	5.7	6.0	8.5	11.1	14.8	25.5	120.3
	47	136	27.7	0.0	0.2	0.7	2.5	5.2	6.3	7.7	5.4	6.4	7.5	9.4	13.0	24.1	188.6
				K-5													
4 May 0635	0	203	50.3	0.2	0.2	1.0	2.4	4.7	10.7	23.1	10.7	11.0	13.4	14.8	19.3	33.9	357.1
	5	230	31.0	0.2	0.4	1.4	3.6	6.0	12.2	17.4	7.5	7.3	7.8	9.2	12.4	24.0	201.1
	10	213	33.7	0.1	0.2	1.0	2.7	5.5	11.2	25.4	13.1	10.4	12.2	14.1	20.1	36.1	184.6
	29	109	48.8	0.0	0.1	0.7	2.1	3.9	4.5	7.2	4.2	4.0	4.6	4.9	8.0	16.6	427.4
	39	112	23.0	0.1	0.1	0.5	2.1	3.7	4.3	7.3	5.5	5.9	6.6	8.5	11.5	18.6	155.7
	52	386	112.2	0.1	0.3	1.8	8.5	14.9	15.5	18.6	19.2	22.1	23.9	26.3	36.3	65.5	869.0

DATE TIME	SAMPLE DEPTH	CUMU-LATIVE VOLUME	CUMU-LATIVE COUNT x 10^{-3}	0 (32.0)	1 (25.4)	2 (20.2)	3 (16.0)	4 (12.7)	5 (10.08)	6 (8.00)	7 (6.35)	8 (5.04)	9 (4.00)	10 (3.17)	11 (2.52)	12 (2.00)	13 (1.59)
				Counts x 10^{-2} Channel Number and Equivalent Spherical Diameter μ													
				STATION													
				K-6													
4 May	0	150	29.6	0.1	0.2	0.6	2.0	4.2	7.1	10.4	10.5	10.6	12.5	14.8	17.5	29.7	176.0
0800	10	175	34.2	0.1	0.2	0.6	2.3	5.9	10.0	12.7	14.7	14.9	15.2	18.0	23.7	40.2	183.7
	30	54	24.4	0.0	0.1	0.2	0.7	1.6	3.1	3.7	3.9	4.0	5.5	8.6	10.6	19.6	182.7
	40	80	30.4	0.1	0.1	0.5	1.0	2.4	2.9	4.0	4.7	5.3	6.0	8.3	10.5	20.3	237.8
	60	180	21.5	0.2	0.3	0.8	1.9	3.3	4.1	6.6	6.2	8.0	7.9	8.9	12.3	18.5	136.2
				K-7													
4 May	0	58	22.4	0.1	0.1	0.2	0.9	1.6	2.8	4.0	4.1	4.3	3.7	4.2	5.6	9.6	182.6
0900	10	153	17.6	0.1	0.3	0.8	2.1	4.5	8.6	9.4	6.0	6.4	6.4	6.6	9.9	14.5	100.9
	30	106	24.7	0.1	0.2	0.4	1.2	2.5	4.0	7.6	11.6	13.4	13.1	14.6	17.3	26.7	135.0
	40	88	25.8	0.0	0.1	0.3	1.0	2.3	4.9	8.1	10.9	11.3	10.5	11.5	14.9	25.5	156.7
	50	18	6.6	0.0	0.1	0.1	0.2	0.5	0.5	1.0	1.0	1.2	1.7	1.9	2.3	4.3	51.2
				K-8													
4 May	0	84	61.5	0.1	0.1	0.3	0.9	1.7	3.3	5.7	8.1	10.3	12.5	15.1	18.6	34.9	503.7
1000	7	86	27.7	0.1	0.1	0.3	1.0	2.0	4.8	6.5	7.3	8.7	9.5	12.2	15.5	27.9	181.0
	20	31	11.1	0.0	0.0	0.2	0.4	0.8	1.6	2.4	2.9	3.2	3.4	4.0	5.4	9.8	76.7
	30	12	6.4	0.0	0.0	0.1	0.2	0.3	0.4	0.6	1.0	1.1	1.1	1.2	1.6	2.1	54.0
	50	16	8.5	0.0	0.0	0.1	0.3	0.4	0.7	0.9	1.2	1.8	2.2	2.5	3.4	6.2	65.1
	70	19	80.1	0.0	0.0	0.0	0.2	0.2	0.4	0.3	0.4	0.5	0.7	2.5	13.9	53.9	728.4
	90	18	26.3	0.0	0.0	0.1	0.2	0.4	0.6	1.2	1.5	1.8	1.9	2.9	4.9	8.2	239.8

DATE TIME	SAMPLE DEPTH	CUMU-LATIVE VOLUME	CUMU-LATIVE COUNT x 10^{-3}	Counts x 10^{-2} Channel Number and Equivalent Spherical Diameter μ													
				0	1	2	3	4	5	6	7	8	9	10	11	12	13
				(32.0)	(25.4)	(20.2)	(16.0)	(12.7)	(10.08)	(8.00)	(6.35)	(5.04)	(4.00)	(3.17)	(2.52)	(2.00)	(1.59)
STATION																	
K-9																	
4 May 1200	0	22	12.2	0.0	0.1	0.1	0.1	0.3	0.4	0.7	1.7	4.5	5.8	4.6	5.2	11.8	86.7
	10	28	17.9	0.0	0.0	0.1	0.3	0.6	1.1	2.6	3.8	6.2	7.2	7.6	8.2	16.7	124.7
	15	22	16.4	0.0	0.0	0.1	0.2	0.4	0.8	2.3	3.7	4.6	5.8	7.4	7.2	11.1	120.9
	25	33	12.1	0.1	0.1	0.2	0.3	0.7	1.2	2.1	2.3	3.0	3.6	4.5	5.9	9.2	88.5
	40	29	10.0	0.0	0.1	0.1	0.2	0.5	1.1	2.0	2.6	2.7	3.1	3.2	4.9	8.6	70.6
	70	10	10.6	0.0	0.1	0.0	0.1	0.2	0.2	0.4	0.7	0.8	1.1	1.9	2.7	5.9	91.7
	100	6	7.2	0.0	0.0	0.0	0.1	0.1	0.2	0.3	0.4	0.6	0.7	1.0	1.8	3.5	63.1
K-10																	
4 May 1330	0	11	14.3	0.0	0.0	0.1	0.1	0.1	0.2	0.3	0.9	2.4	3.3	3.6	3.9	9.7	118.4
	10	14	20.0	0.0	0.0	0.1	0.1	0.2	0.3	0.6	1.5	4.1	6.4	5.7	6.8	15.7	158.6
	15	7	6.5	0.0	0.0	0.1	0.1	0.1	0.2	0.3	0.4	1.2	1.1	1.2	1.6	3.7	55.2
	25	6	5.5	0.0	0.0	0.0	0.1	0.2	0.1	0.3	0.5	1.1	1.1	1.1	1.2	2.6	47.0
	36	8	5.5	0.0	0.0	0.0	0.1	0.1	0.3	0.2	0.5	0.5	0.8	0.9	1.1	2.0	48.5
	50	32	52.6	0.0	0.0	0.1	0.3	0.7	1.1	1.8	2.1	2.3	2.8	4.2	9.9	44.9	455.5
	67	35	21.4	0.0	0.0	0.1	0.5	1.0	2.1	3.1	3.3	2.8	3.2	3.6	4.3	8.3	181.6

DATE TIME	SAMPLE DEPTH	CUMU-LATIVE VOLUME	CUMU-LATIVE COUNT x 10^{-3}	Counts x 10^{-2} Channel Number and Equivalent Spherical Diameter μ 0 (32.0)	1 (25.4)	2 (20.2)	3 (16.0)	4 (12.7)	5 (10.08)	6 (8.00)	7 (6.35)	8 (5.04)	9 (4.00)	10 (3.17)	11 (2.52)	12 (2.00)	13 (1.59)
				STATION													
				K-11													
4 May 1500	0	14	15.8	0.0	0.0	0.0	0.1	0.2	0.2	0.5	1.8	5.7	7.0	7.2	7.4	16.8	111.2
	5	16	12.0	0.0	0.1	0.1	0.1	0.1	0.3	0.6	1.6	6.1	7.0	6.8	5.9	10.4	80.7
	15	10	11.9	0.0	0.0	0.0	0.1	0.1	0.1	0.5	1.1	2.9	3.7	2.9	3.3	8.1	96.2
	36	5	5.6	0.0	0.0	0.0	0.1	0.1	0.1	0.3	0.5	0.9	0.8	0.9	1.7	2.9	47.8
	41	12	7.4	0.0	0.0	0.1	0.1	0.3	0.3	0.4	0.5	1.1	1.2	1.6	2.2	4.4	61.6
	55	5	5.3	0.0	0.0	0.0	0.1	0.1	0.2	0.3	0.3	0.5	0.6	0.7	1.0	1.9	47.6
	68	22	7.1	0.0	0.1	0.1	0.2	0.6	1.2	1.8	1.8	1.5	1.7	1.5	2.2	3.5	54.9
	80	15	7.2	0.0	0.0	0.1	0.2	0.5	0.6	0.8	0.9	1.2	1.3	1.6	2.1	3.5	59.2
	100	18	32.2	0.0	0.0	0.1	0.2	0.3	0.5	0.7	1.6	5.0	6.1	6.2	8.3	18.1	275.3
				L-1													
4 May 1645	0	26	10.1	0.0	0.1	0.1	0.2	0.5	1.1	2.6	2.5	2.7	3.1	3.1	3.7	7.8	73.2
	5	30	8.5	0.1	0.0	0.1	0.3	0.7	1.1	2.6	2.6	2.5	2.9	3.0	3.1	5.1	60.4
	10	58	15.2	0.1	0.1	0.3	0.6	0.7	2.0	3.8	5.3	5.8	5.8	7.1	8.2	16.4	96.0
	15	38	16.6	0.1	0.1	0.1	0.4	0.5	1.4	2.5	3.6	4.5	5.3	6.6	7.5	15.9	117.5
	30	49	13.2	0.1	0.1	0.1	0.5	1.4	2.9	4.3	4.5	4.0	3.8	5.4	7.4	12.6	84.6
	50	30	12.5	0.1	0.0	0.1	0.3	0.7	1.1	1.8	1.8	2.1	2.2	3.1	4.0	8.2	71.2
	75	15	9.9	0.0	0.1	0.0	0.1	0.2	0.2	0.8	0.8	1.2	2.4	4.0	6.5	10.5	72.4
	100	18	7.8	0.0	0.1	0.1	0.2	0.3	0.6	0.8	0.9	1.2	1.2	1.8	3.3	5.3	62.3
	150	12	19.5	0.0	0.0	0.1	0.1	0.2	0.3	0.3	0.5	0.7	1.3	8.7	24.2	36.1	122.4
	200	17	9.2	0.0	0.0	0.1	0.2	0.4	0.9	1.1	1.2	1.2	1.7	2.0	3.8	9.1	70.3

DATE TIME	SAMPLE DEPTH	CUMU-LATIVE VOLUME	CUMU-LATIVE COUNT x 10^{-3}	Counts x 10^{-2} — Channel Number and Equivalent Spherical Diameter μ: 0 (32.0)	1 (25.4)	2 (20.2)	3 (16.0)	4 (12.7)	5 (10.08)	6 (8.00)	7 (6.35)	8 (5.04)	9 (4.00)	10 (3.17)	11 (2.52)	12 (2.00)	13 (1.59)
				STATION													
				L-2													
4 May 1800	0	46	14.6	0.1	0.1	0.2	0.6	0.9	2.0	3.1	4.1	3.7	3.7	4.9	6.7	13.8	102.4
	5	47	14.8	0.1	0.2	0.3	0.5	0.7	1.4	3.3	4.5	4.1	4.9	6.0	7.9	16.2	98.1
	15	28	12.5	0.0	0.0	0.2	0.3	0.6	1.0	2.0	3.0	3.2	3.1	3.7	6.1	10.4	91.9
	30	60	15.0	0.2	0.2	0.3	0.5	1.0	1.8	1.7	2.6	3.4	3.7	5.3	10.2	19.1	99.8
	50	45	11.2	0.1	0.1	0.4	0.5	0.8	1.1	1.8	1.9	3.1	3.8	5.6	7.6	13.5	72.2
	75	11	7.5	0.0	0.0	0.1	0.2	0.2	0.3	0.4	0.5	0.7	1.2	1.7	2.9	5.9	61.3
	100	25	13.2	0.0	0.1	0.1	0.4	0.4	0.7	1.0	1.4	1.8	2.5	3.4	5.7	10.6	104.0
				L-3													
4 May 2000	0	627	92.1	0.3	0.7	2.4	9.4	26.4	35.9	39.6	28.6	20.4	21.4	25.5	40.0	97.9	573.0
	5	986	72.3	0.4	1.8	8.3	22.0	27.2	38.2	33.0	14.2	16.4	14.4	16.7	27.8	66.9	435.9
	20	122	26.0	0.1	0.1	0.5	2.0	5.0	6.4	5.7	6.0	5.8	6.7	7.6	11.5	20.8	181.6
	30	40	12.2	0.0	0.1	0.4	0.9	0.4	0.8	1.3	2.6	1.2	1.4	4.8	8.8	4.5	95.0
	45	108	32.1	0.0	0.1	0.4	1.9	4.4	5.5	4.9	4.9	5.5	6.9	8.3	12.5	22.3	243.8
	60	79	25.3	0.0	0.1	0.5	1.6	2.5	3.1	2.9	3.1	3.4	4.3	5.9	7.8	15.6	202.7
				L-4													
4 May 2130	0	116	313.0	0.1	0.2	0.5	1.2	1.9	2.3	2.3	2.5	2.8	3.7	5.7	31.7	387.0	2688.0
	10	500	85.3	0.4	0.4	2.2	7.4	19.4	24.4	30.8	28.4	23.1	25.4	30.0	46.0	84.5	530.8
	25	70	14.3	0.0	0.1	0.4	1.2	2.4	3.3	4.8	3.6	3.3	3.7	3.6	5.5	8.7	103.0
	45	69	18.3	0.0	0.1	0.4	1.2	2.1	3.3	3.8	3.8	4.4	4.9	6.2	8.6	13.5	130.1

Counts x 10^{-2}

DATE TIME	SAMPLE DEPTH	CUMU-LATIVE VOLUME	CUMU-LATIVE COUNT x 10^{-3}	Channel Number and Equivalent Spherical Diameter μ													
				0	1	2	3	4	5	6	7	8	9	10	11	12	13
				(32.0)	(25.4)	(20.2)	(16.0)	(12.7)	(10.08)	(8.00)	(6.35)	(5.04)	(4.00)	(3.17)	(2.52)	(2.00)	(1.59)
STATION																	
M-1																	
4 May 2200	0	480	112.0	0.3	0.5	2.0	6.7	15.6	31.8	36.2	20.0	19.4	17.7	21.0	33.7	81.3	833.8
	5	530	74.2	0.2	0.6	2.0	6.5	18.0	40.6	41.3	26.9	26.3	21.1	23.3	38.7	76.5	420.3
	10	548	63.4	0.1	0.5	2.6	9.4	22.6	31.4	35.9	21.4	16.5	15.8	19.9	28.0	55.8	373.7
	20	125	22.1	0.1	0.2	0.5	2.1	4.7	6.2	6.0	6.5	7.2	8.2	10.1	17.4	27.5	124.5
	30	79	148.6	0.1	0.1	0.3	0.9	1.8	2.3	2.2	1.5	1.7	2.6	12.4	97.7	333.3	1029.5
M-2																	
4 May 2330	0	349	46.7	0.1	0.5	1.7	6.3	12.9	14.9	23.5	13.7	12.1	13.8	18.0	32.5	61.8	255.4
	10	290	39.7	0.1	0.3	1.3	5.2	11.1	14.8	19.2	11.8	11.5	11.7	13.6	20.1	40.2	235.7
	25	41	15.2	0.0	0.1	0.2	0.7	1.3	2.5	2.2	2.2	2.5	3.3	4.3	5.7	9.5	117.5
	30	41	15.0	0.0	0.1	0.6	0.9	1.5	1.9	2.7	2.5	3.2	3.7	5.2	6.9	10.6	111.1
	40	98	21.9	0.1	0.2	0.5	1.9	2.5	3.4	5.9	4.9	5.9	6.6	8.9	13.7	20.9	143.5
M-3																	
5 May 0045	0	145	30.4	0.1	0.3	0.9	2.2	4.0	5.0	8.8	7.1	7.8	10.7	15.0	21.7	34.3	186.1
	15	107	23.4	0.1	0.2	0.8	1.5	2.7	3.2	6.9	4.9	5.6	6.3	8.4	12.0	22.2	159.5
	22	58	12.9	0.1	0.1	0.5	0.8	1.2	1.4	3.8	3.5	4.2	5.6	8.0	9.8	14.2	76.3
	30	54	14.6	0.0	0.1	0.4	0.9	1.3	1.7	3.7	3.5	4.7	5.6	8.2	10.7	15.8	89.6
	40	114	18.6	0.0	0.1	0.6	2.3	4.0	5.0	6.6	5.5	5.6	6.4	7.2	10.5	18.6	113.5

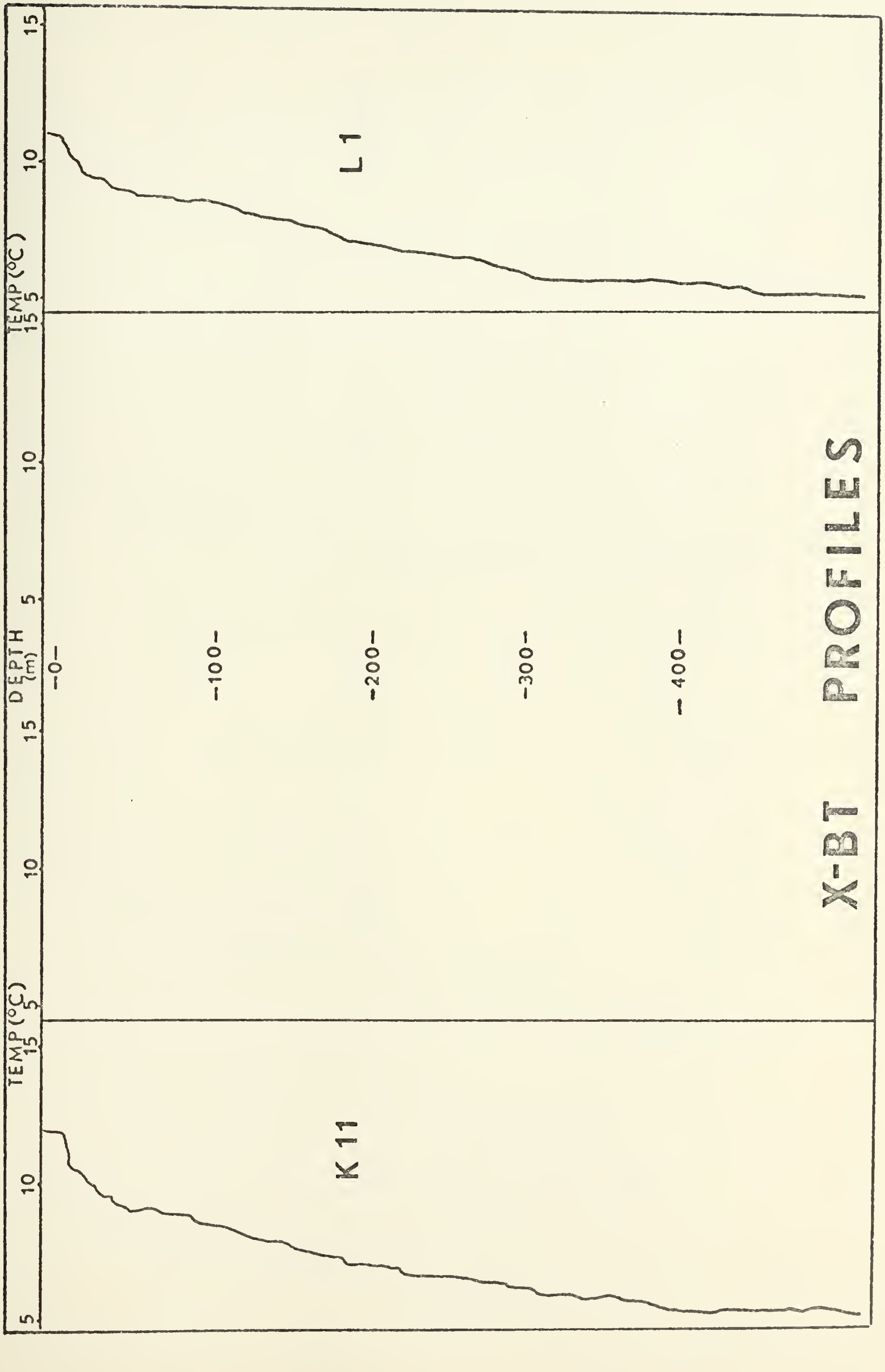
DATE TIME	SAMPLE DEPTH	CUMU-LATIVE VOLUME	CUMU-LATIVE COUNT x 10^{-3}	Counts x 10^{-2} Channel Number and Equivalent Spherical Diameter μ 0 (32.0)	1 (25.4)	2 (20.2)	3 (16.0)	4 (12.7)	5 (10.08)	6 (8.00)	7 (6.35)	8 (5.04)	9 (4.00)	10 (3.17)	11 (2.52)	12 (2.00)	13 (1.59)
				STATION													
				M-4													
5 May 0200	0	491	63.7	0.2	0.7	2.6	6.7	14.1	30.7	42.0	20.8	19.1	24.3	33.0	45.7	74.5	322.8
	3	266	92.8	0.1	0.4	2.1	5.6	9.2	9.6	7.8	3.6	2.9	3.3	5.8	13.5	42.7	821.3
	10	338	41.0	0.4	0.5	2.0	4.5	8.8	12.2	32.9	14.7	13.8	16.8	20.4	27.4	46.3	209.2
	15	97	21.7	0.1	0.2	0.7	1.7	2.9	3.2	5.3	4.6	5.7	6.6	7.8	13.3	20.8	144.7
	29	137	24.6	0.0	0.1	1.0	2.8	4.7	4.9	6.6	6.0	6.9	8.7	9.8	15.4	25.3	154.0
				M-5													
5 May 0300	0	194	29.9	0.1	0.2	0.8	2.5	5.0	11.0	19.0	13.7	12.6	12.4	12.8	18.4	31.6	158.7
	3	229	167.8	0.1	0.3	0.9	2.6	5.4	10.5	21.8	18.6	20.8	24.8	31.2	38.7	70.6	1431.9
	8	304	158.3	0.3	0.5	1.0	3.5	7.4	13.3	30.3	19.9	19.8	23.8	30.5	47.6	119.7	1265.2
	12	274	48.9	0.1	0.3	1.3	3.7	8.2	13.0	32.1	15.0	14:4	15.0	18.8	26.7	43.7	297.1
	24	94	20.5	0.1	0.1	0.5	1.8	3.1	3.6	6.3	4.3	4.5	4.5	5.7	9.6	15.7	145.2

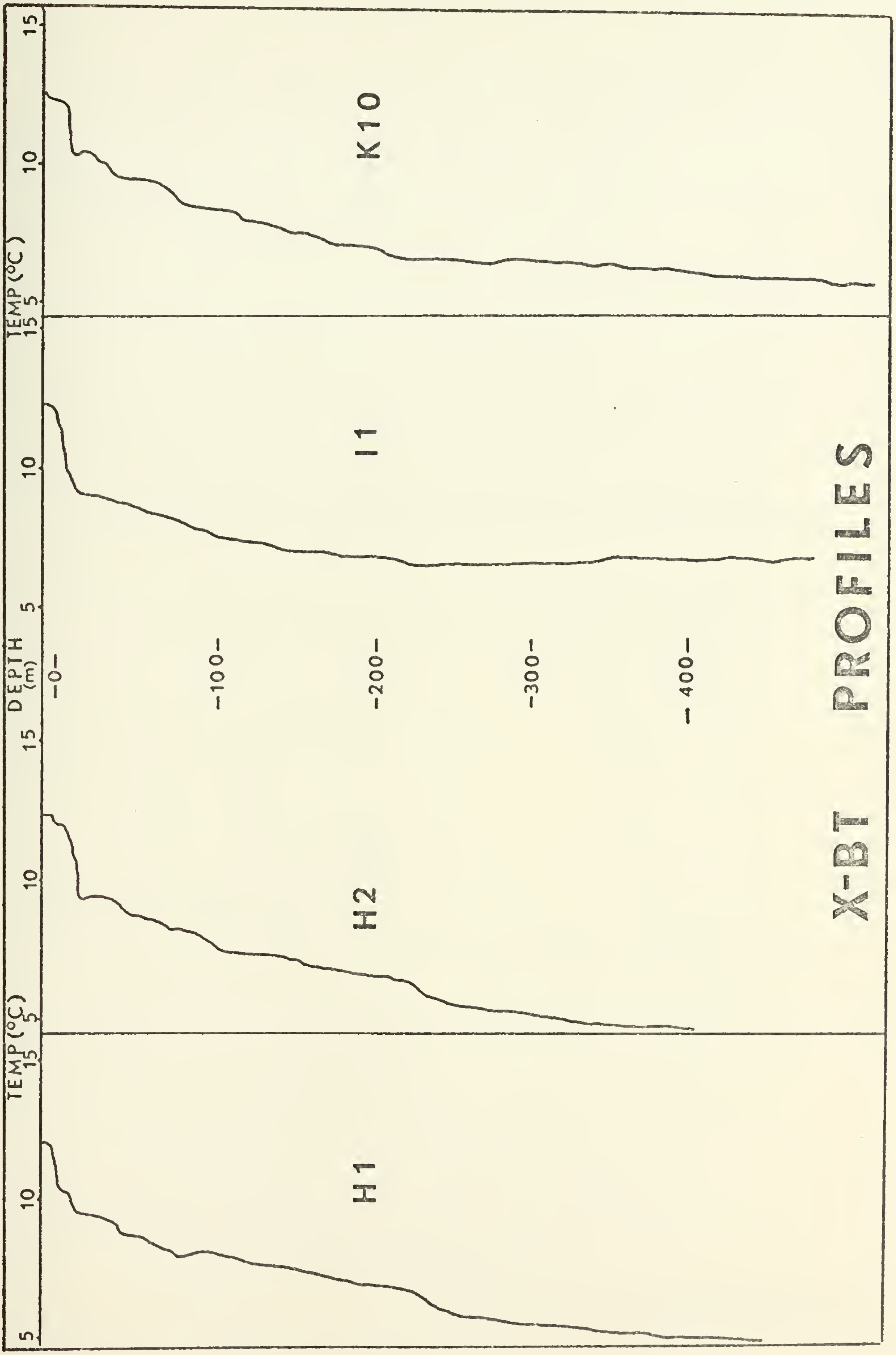
DATE TIME	SAMPLE DEPTH	CUMU-LATIVE VOLUME	CUMU-LATIVE COUNT x 10^{-3}	Counts x 10^{-2} Channel Number and Equivalent Spherical Diameter μ 0 (32.0)	1 (25.4)	2 (20.2)	3 (16.0)	4 (12.7)	5 (10.08)	6 (8.00)	7 (6.35)	8 (5.04)	9 (4.00)	10 (3.17)	11 (2.52)	12 (2.00)	13 (1.59)
								STATION									
								M-6									
5 May 0400	2	340	53.2	0.1	0.4	1.7	5.1	10.0	15.5	39.3	19.0	16.8	21.6	26.9	39.1	62.8	274.3
	11	385	86.8	0.4	0.6	1.6	5.3	9.3	15.6	42.9	20.4	17.8	22.0	26.3	41.4	78.0	585.9
	14	269	40.8	0.2	0.2	1.0	3.9	8.9	13.3	28.8	14.5	12.2	14.1	15.3	23.5	40.9	231.1
	17	216	28.8	0.1	0.3	1.3	4.2	7.0	7.1	15.9	9.6	7.9	8.5	10.8	16.4	30.4	168.2
	25	132	24.6	0.1	0.2	0.6	2.0	4.0	4.8	10.7	7.3	7.1	9.2	11.4	16.2	24.8	147.3
								M-7									
5 May 0530	0	196	45.8	0.1	0.2	0.8	2.2	4.7	11.0	18.8	18.0	17.5	19.4	22.7	31.2	48.1	263.2
	5	251	51.7	0.1	0.4	1.0	3.3	6.9	12.8	26.0	17.2	17.5	18.9	23.5	32.9	54.6	301.9
	10	340	49.5	0.1	0.3	1.2	5.0	13.1	17.1	35.0	16.8	17.5	19.4	23.5	32.0	49.0	265.0
	16	202	29.6	0.3	0.3	1.0	2.7	5.7	8.7	12.6	10.1	10.7	11.1	14.6	19.3	32.6	166.6
	20	198	28.8	0.0	0.3	1.0	3.7	6.7	8.8	11.7	10.7	11.6	11.2	12.2	15.9	27.0	166.8

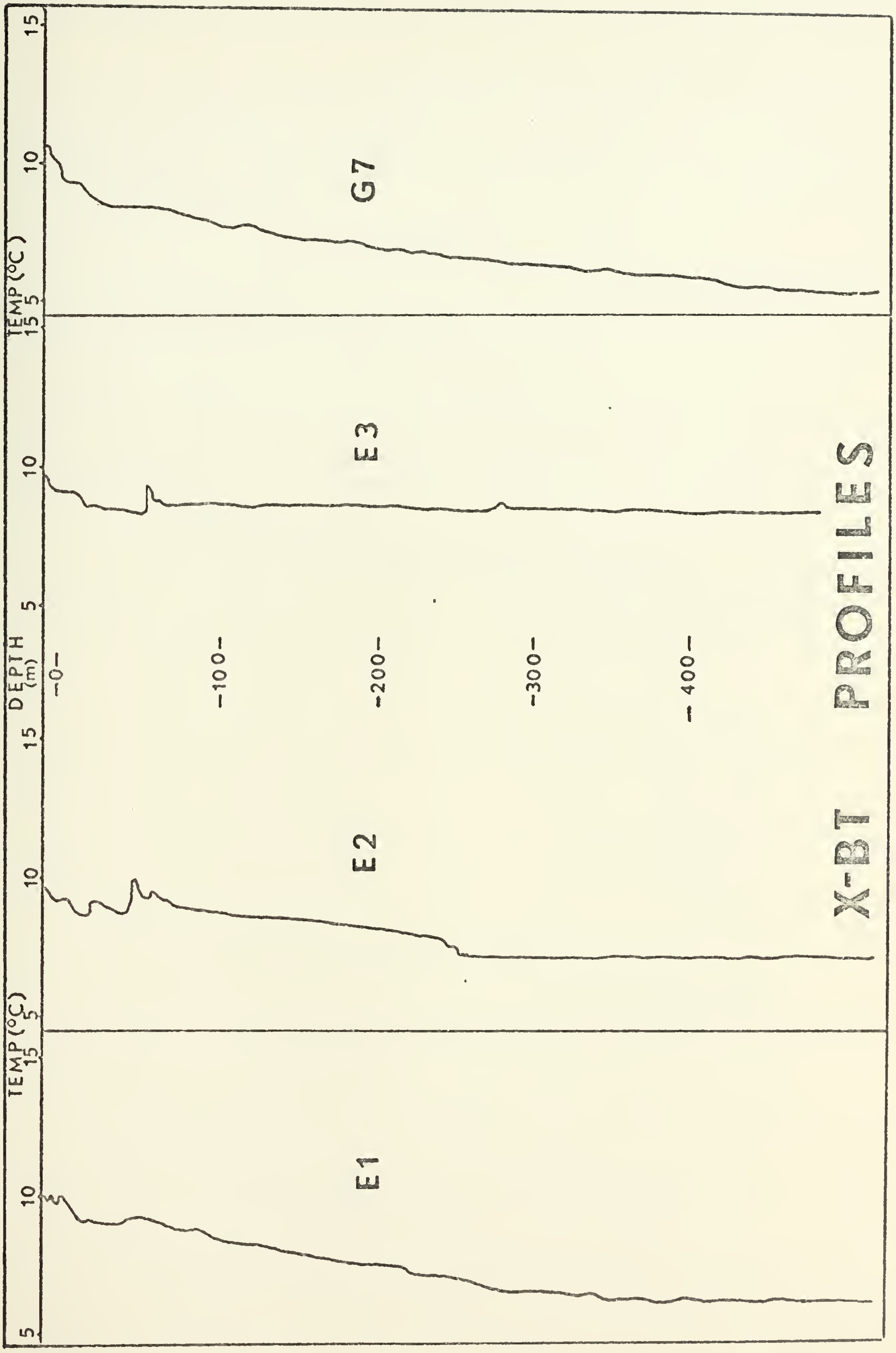
APPENDIX

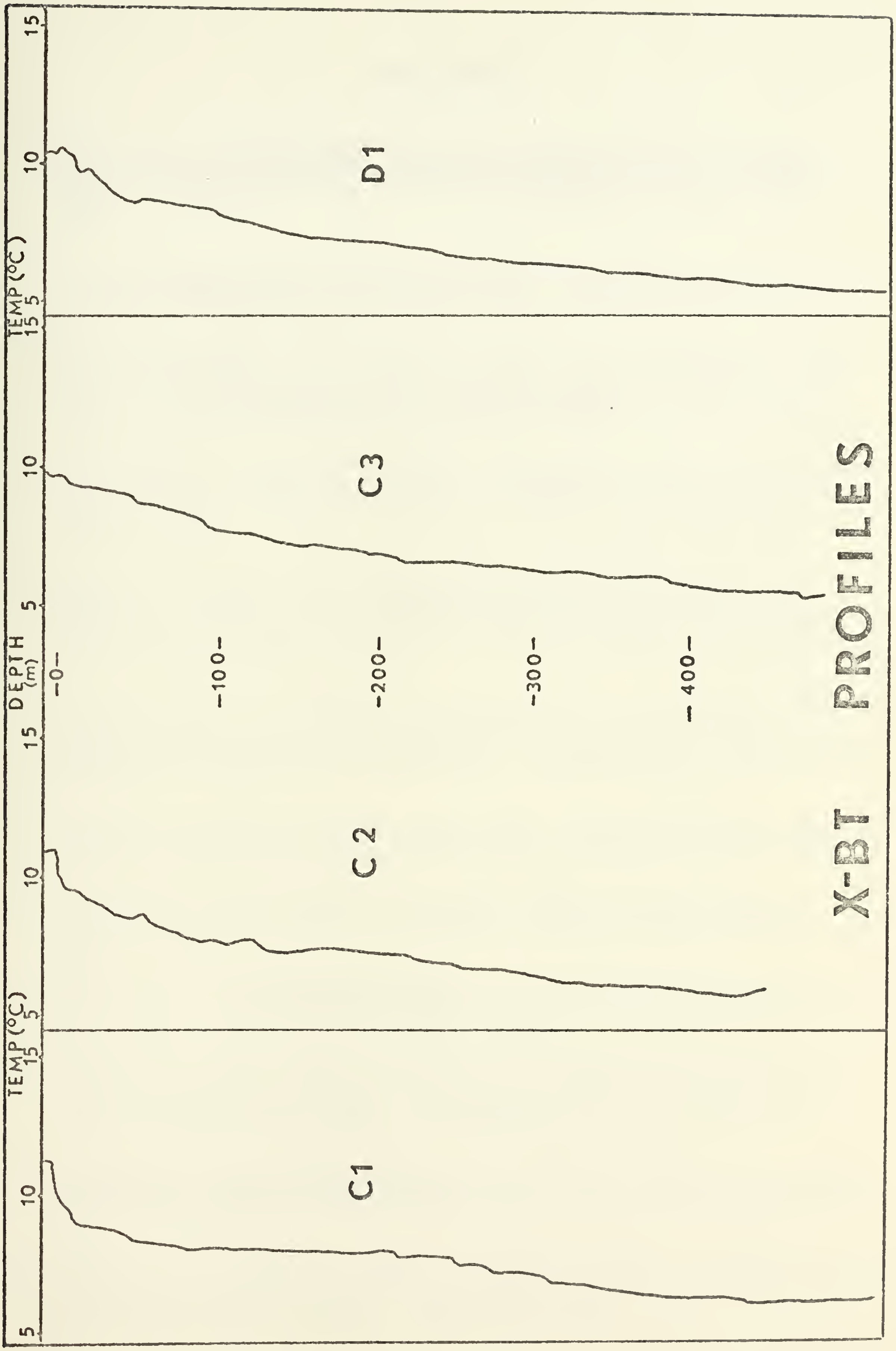
Bathythermograph Traces with Temperatures

in ^{o}C and Depths in m


X-BT PROFILES
L1
K11
TEMP (°C)
5
10
15
DEPTH (m)
-0-
-100-
-200-
-300-
-400-


X-BT PROFILES
H1
H2
I1
K10
TEMP (°C)
DEPTH (m)
5
10
15
-0-
-100-
-200-
-300-
-400-


X-BT PROFILES
TEMP (°C)
DEPTH (m)
-0-
-100-
-200-
-300-
- 400-
5
10
15
E1
E2
E3
G7



X-BT PROFILES
DEPTH (m)
-0-
-100-
-200-
-300-
-400-
TEMP (°C)
5
10
15
C1
C2
C3
D1

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Moss Landing, California 95039

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Miami, Florida 33149

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Marine Sciences Institute
University of California
Santa Barbara, California 93106

65. Dr. Robert Andrews 1
Department of Oceanography
Naval Postgraduate School
Monterey, California 93940

66. Coastal Engineering Branch 1
Planning Division
U. S. Army Engineering Division, South Pacific
630 Sansome Street
San Francisco, California 94111

67. Professor Glenn H. Jung 1
Department of Oceanography
Naval Postgraduate School
Monterey, California 93940

68. LT Arthur B. Shepard 3
USCGC Burton Island WAGB-283
P.O. Box 20820
Long Beach, California 90801

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13. ABSTRACT

An examination of the region between Monterey Bay and San Francisco Bay, California was conducted from 29 April to 5 May 1970 to study the effects of upwelling on the Central California,coastal region. Six parameters: temperature, phosphate, beam transmission for light, chlorophyll a, Coulter particle size distributions, and oxygen were observed at eighty-five stations from the surface to 100 m in the cruise area. The data gathered are presented in the form of horizontal contours and profiles which indicate: (1) Almost the entire surface layer was saturated with respect to oxygen. (2) There were four areas, at the northern and southern ends of Monterey Bay, off Point Montara, and west of the entrance to San Francisco Bay, which exhibited high values of chlorophyll a, oxygen, and particle count, for correspondingly low phosphate values and low beam transmission. (3) These productive areas are inshore, generally within 5-10 miles of the coast. (4) A peak in the size distribution of particles was evident in the productive surface layers, within the observable range of particle diameters (1.59 to 32.0 μ). (5) Plots of oxygen versus phosphate showed that similar slopes of about $-3.1 \frac{\mu\text{g-at/l } PO_4}{\text{ml/l } O_2}$ were observed for inshore and offshore regions. The inshore regions exhibited higher phosphate values for a given value of oxygen which is probably a result of upwelling. (6) There was a fair correlation between beam transmittance and particle count. High values of beam transmittance were generally associated with low total Coulter count, e.g., 90%/m and 6000 counts per 2 ml. Conversely, low values of beam transmittance were associated with high particle counts, for example 5%/m and 85,000 counts per 2 ml.

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central California coast						
chlorophyll a						
Coulter counter						
hydrological optics						
light attenuation						
light transmissivity						
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suspended material						
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